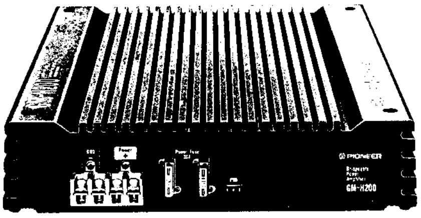
Service Manual

PIONEER

The Art of Entertainment

- GM-H200/UC



ORDER NO.
CRT1381

BRIDGEABLE POWER AMPLIFIER

GM-H200 UC
GM-4200 EW

NOTE:

- **In this unit, an electric current of about 40A flows at the continuous power output of 4Ω and a current close to 60A flows at 2Ω. Even when there is no signal, a current around 4A flows. Therefore, make a test at an appropriate signal level in consideration of the power consumption of the power supply unit.**

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FA MAY 1991 Printed in Japan

SAFETY INFORMATION (UC MODEL)

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5). When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SPECIFICATIONS

• GM-H200/UC

Power source	14.4 V DC (10.8 - 15.6 V allowable)
Grounding system	Negative type
Current consumption	40 A (at continuous power, 4Ω)
Average current drawn*	13 A (4Ω for two channels) 18 A(4Ω for one channel)
Fuse	30 A×2
Dimensions	264 (W) × 58 (H) × 335 (D) mm [10 - 3/8 (W) × 2 - 1/4 (H) × 13 - 1/4 (D) in.]
Weight	7.0 kg (15.4 lbs.)(Leads for wiring not included)
Maximum power output	200 W × 2/600 W × 1 (EIAJ)
Continuous power output	100 W × 2/300 W × 1 (at 4Ω, 20 - 20,000 Hz, 0.05% THD) 150 W × 2 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
Load impedance	4Ω (2 - 8Ω allowable)
Frequency response	10 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	105 dB (IHF - A network)
Distortion	0.001% (at 20 W, 1 kHz)
Separation	70 dB (1 kHz)
Input level	0.2 - 2 V /8 kΩ

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

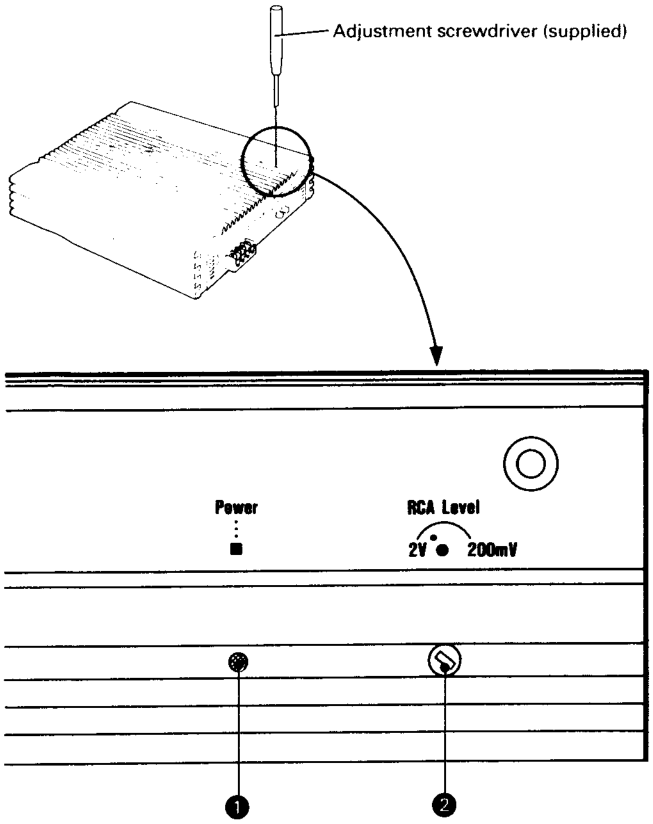
Note:
Specifications and the design are subject to possible modification without notice due to improvements.

• GM-4200/EW

Power source	14.4 V DC (10.8 - 15.6 V allowable)
Grounding system	Negative type
Current consumption	40 A (at continuous power, 4Ω)
Average current drawn *	13 A (4Ω for two channels) 18 A [4Ω for one channel (2Ω position)]
Fuse	30 A × 2
Dimensions	264 (W) × 58 (H) × 335 (D) mm
Weight	7.0 kg (Leads for wiring not included)
Maximum power output	240 W × 2/640 W × 1 (EIAJ)
Continuous power output	120 W × 2/320 W × 1 (at 4Ω, 20 - 20,000 Hz, 0.05% THD) 160 W × 2 (at 2Ω, 20 - 20,000 Hz, 0.05% THD)
Load impedance	4Ω (2 - 8Ω allowable)
Frequency response	5 - 50,000 Hz (+0 dB, -1 dB)
Signal-to-noise ratio	105 dB (IEC - A network)
Distortion	0.0009% (at 20 W, 1 kHz)
Separation	70 dB (1 kHz)
Input level	RCA: 0.4 - 4 V /8 kΩ DIN: 70 - 500mV /22 kΩ

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

2. CONTROLS AND THEIR USE (UC MODEL)



❶ Power Indicator

The power indicator lights when the power is switched on.

❷ RCA Input Level Control

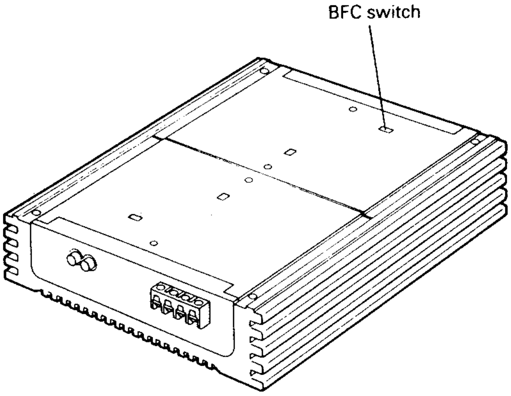
Adjusting the RCA input level control will help match the output of the car stereo to the Pioneer amplifier. If the output is low even when the volume of the car stereo is turned up, turn this control clockwise. If there is distortion when the volume of the car stereo is turned up, turn this control counterclockwise.

- Adjust control ❷ with the supplied adjustment screwdriver. Keep the screwdriver if you need to readjust the controls later.

BFC (Beat Frequency Control) switch

Note:
Beating is the combining of two or more frequencies to produce sum and difference frequencies called beats.

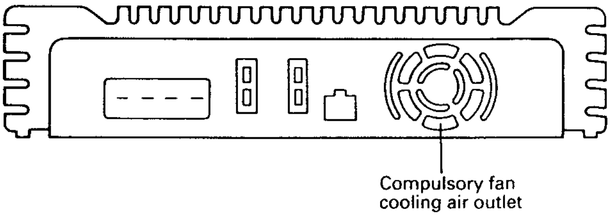
If beating is heard when listening to AM stations on you car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.



Compulsory fan cooling system

This is a high-power amplifier, so it produces a lot of heat. To keep it cool, it has fan cooling.

- When the power of the car stereo is turned on, the compulsory cooling fan of this power amplifier works automatically and cools inside of this amplifier.
- Install the amplifier so there is enough space front and back to allow the fan cooling to work properly. If the front or back side is covered, the amplifier may malfunction or fail.



3. CONNECTING THE UNITS (UC MODEL)

WARNINGS

- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they touch sharp edges. Be sure to use a rubber O-ring grommet when routing wires through metal, such as the firewall between the engine and passenger compartments.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- Amplifier ground connections (Black) should only be made to the vehicle's metal body or chassis for safety reasons. The ground circuit carries the same current as the power lead from the vehicle's battery. To get good contact when grounding, sand the metal surface to expose the bare metal. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems.
- Always connect the supplied special (red) battery lead directly to the positive (+) terminal of the battery.

- It is recommended that the speakers connected to the amplifier have the minimum ratings shown below. If a speaker has a rating below what is recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

Connecting the special red battery lead

Use the special (red) battery lead supplied with the amplifier. This lead contains the appropriately rated fuse [30-amp fuse (×2)]. This special (red) battery lead is made of heavy gauge wire so it is capable of carrying substantial amounts of current. Connect both of the two terminals at each end of the battery lead securely. Should any one terminal come loose, there may be a short circuit, perhaps causing electric shock or even a fire.

Route the special battery lead from the engine compartment through the firewall or vehicle body to the passenger compartment and connect it to the amplifier.

Drill an 14-mm diameter hole in the firewall or vehicle body and insert an O-ring rubber grommet and pull the battery lead through into the passenger compartment.

Mode	Speaker ratings	
Two-channel	Maximum	200 W
	Nominal	100 W
One-channel	Maximum	600 W
	Nominal	300 W

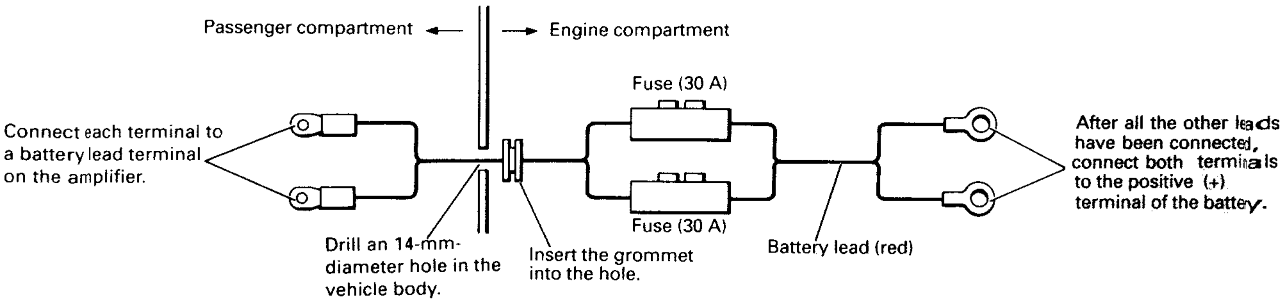
In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the amplifier power leads away from the signal cords (RCA cords) and speaker leads. Also, keep the power leads away from any antenna cords.
- Before finalizing the installation, turn everything on, and make sure everything works correctly and listen for noise in the system.
- For detailed information on connections between different units and the amplifier, use the instruction manuals for the units. It is important to follow their recommendations precisely.

Note:
The O-ring rubber grommet is important because it protects the insulation on the battery lead from being worn away from normal vibrations and rubbing against sharp metal edges. Failure to install this grommet could result in a short circuit and fire.

While installing the wires, do not connect the positive (+) lead of the battery until the other leads have been connected. This will prevent accidental shorting to any other wiring or ground.

After making all other connections at the amplifier, connect the battery lead terminal of the amplifier to the positive (+) terminal of the battery.


Passenger compartment
Engine compartment
Fuse (30 A)
Connect each terminal to a battery lead terminal on the amplifier.
After all the other leads have been connected, connect both terminals to the positive (+) terminal of the battery.
Fuse (30 A)
Drill an 14-mm-diameter hole in the vehicle body.
Insert the grommet into the hole.
Battery lead (red)

After making all other connections at the amplifier, connect the battery lead terminal of the amplifier to the positive (+) terminal of the battery.

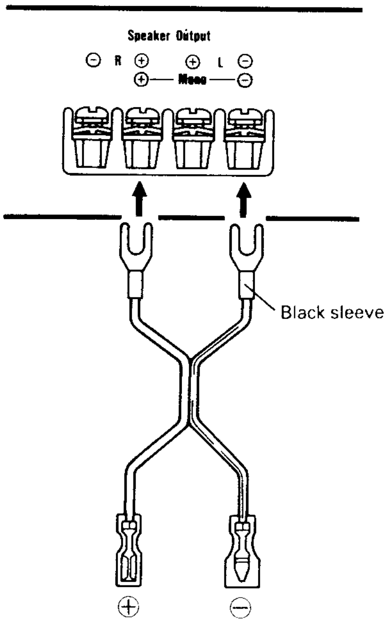
Connecting the leads (supplied)

Connecting the speaker leads

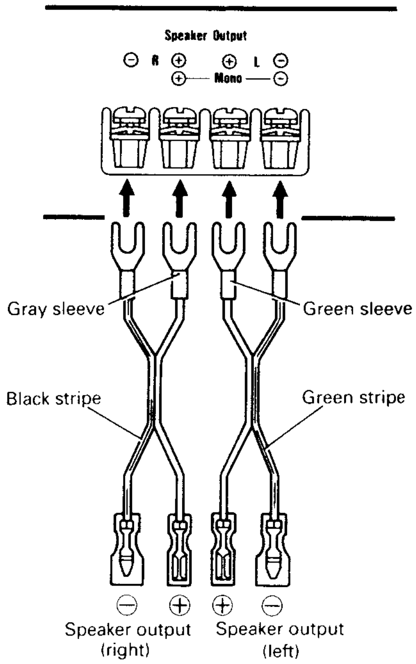
The speaker output mode can be two-channel (stereo), one-channel (mono), or three-channel (stereo + mono). Connect the speaker leads to suit the mode. To connect the speaker leads to the speaker terminals of the amplifier, see the connection diagram for each channel. Be careful with the polarity (+ and –), and with which channel is which (left [L] and right [R]).

- If the amplifier is used in three-channel mode, inductors and capacitors are needed. For more information, see "Three-channel mode (stereo + mono)".

One-channel mode (mono)


Speaker Output
⊖ R ⊕ ⊕ L ⊖
⊕— Mono —⊖
Black sleeve
⊕
⊖

Two-channel mode (stereo)

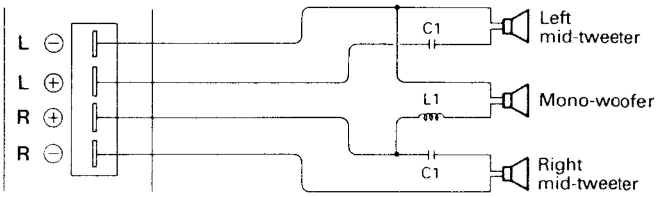

Speaker Output
⊖ R ⊕ ⊕ L ⊖
⊕— Mono —⊖
Gray sleeve
Green sleeve
Black stripe
Green stripe
⊖ ⊕ ⊕ ⊖
Speaker output (right)
Speaker output (left)

The following examples (1 and 2) require advanced understanding of electronics. If you do not understand the diagram, please have the work done by your nearest authorized Pioneer installation specialist.

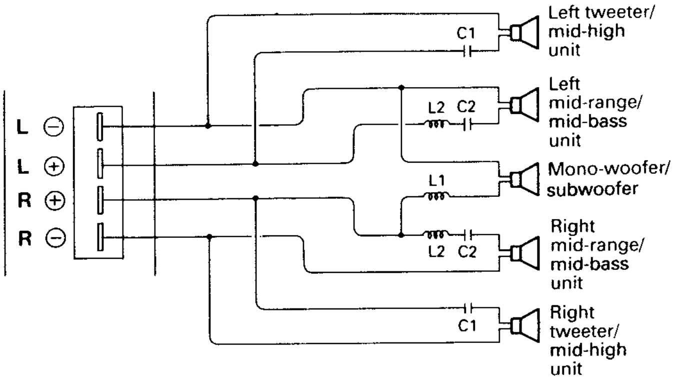
Three-channel mode (stereo + mono)

The power amplifier is basically a two-channel/one-channel bridgeable amplifier, but three channels can be achieved by combining the stereo and mono modes using inductors and capacitors. Some typical examples are given below.

Example 1 Three-channel, two-way system


L ⊖
L ⊕
R ⊕
R ⊖
C1
L1
C1
Left mid-tweeter
Mono-woofer
Right mid-tweeter

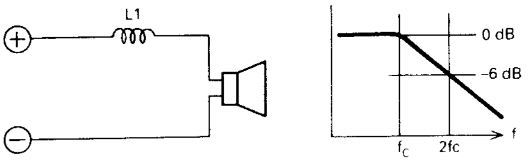
Example 2 Three-channel, three-way system


L ⊖
L ⊕
R ⊕
R ⊖
C1
Left tweeter/ mid-high unit
L2 C2
Left mid-range/ mid-bass unit
L1
Mono-woofer/ subwoofer
L2 C2
Right mid-range/ mid-bass unit
C1
Right tweeter/ mid-high unit

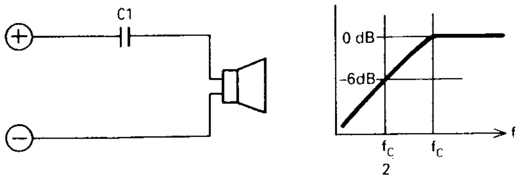
- The inductor (L1 or L2 in the diagram) acts as a low-pass filter. The capacitor (C1 or C2 in the diagram) acts as a high-pass filter.
- In the three-channel mode Pioneer recommends that an inductor (L) be used on the woofer/subwoofer, and that a capacitor (C) be used on the midrange/tweeter. Remember when bridging an amplifier it will see only half of the original speaker impedance. Therefore, you must use speakers that have ratings of 4 ohms or higher. If you use speakers that have lower impedance ratings it may cause damage to the amplifier.
- When the inductors and capacitors are connected to the speaker leads, secure or solder them so they cannot be pulled loose. Tape or use heat shrink on the joints to prevent short circuits.

Setting the filter constant

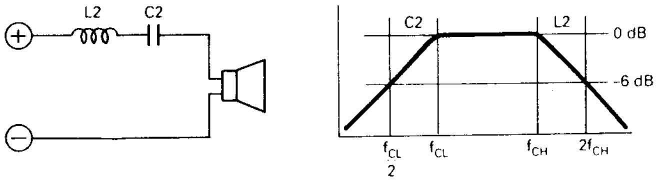
① Low-pass filter (for subwoofer/woofer): 6 dB/octave


L1
+
−
0 dB
-6 dB
f
f_C
2fc

② High-pass filter (for mid-tweeter/mid-high-tweeter): 6 dB/octave


C1
+
−
0 dB
-6dB
f
$\frac{f_C}{2}$
f_C

③ Band-pass filter (combination of low-pass filter and high-pass filter for mid-bass/mid): 6 dB/octave


L2
C2
+
−
C2
L2
0 dB
-6 dB
$\frac{f_{CL}}{2}$
f_{CL}
f_{CH}
$2f_{CH}$

Component Guide

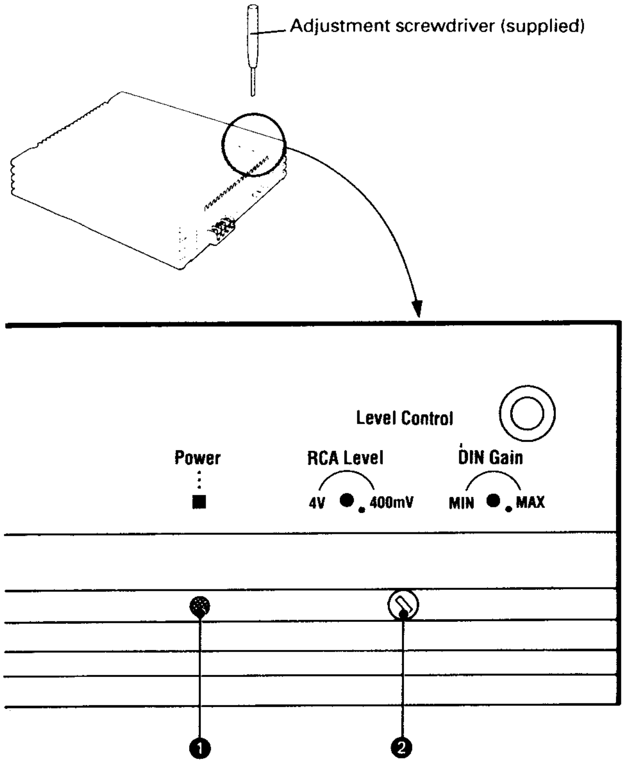
Speaker load impedance	2Ω		4Ω		8Ω	
fc (Hz)	L (mH)	C (μF)	L (mH)	C (μF)	L (mH)	C (μF)
50	6.4	1600	12.7	800	25.5	400
80	4.0	1000	8.0	500	16	250
125	2.5	560	5.1	300	10	160
200	1.6	400	3.2	200	6.4	100
320	1.0	250	2.0	125	4	62
500	0.64	160	1.3	80	2.6	40
800	0.4	100	0.8	50	1.6	25
1250	0.25	64	0.5	30	1.0	16
2000	0.16	40	0.3	20	0.64	10
3200	0.1	25	0.2	12.5	0.4	6.2
5000	0.06	16	0.13	8	0.26	4
8000	0.04	10	0.08	5	0.16	2.5
10000	0.03	8	0.06	4	0.13	2

- A multi-channel system can be set up using a combination of filters 1 , 2 , and 3 . The inductance (L) and capacitance (C) will determine the frequency (Hz) that the speaker will reproduce. Refer to the chart on the above to determine the components required.

WARNING

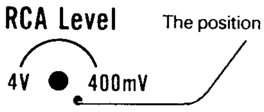
- Use the capacitors specified. Non-polarized capacitors rated at over ±40 V should be used for C1 and C2 in the diagram. Because of the voltage output of the amplifier it is very important to use non-polarized capacitors rated at or over 40 V. This will prevent a safety hazard.

4. CONTROLS AND THEIR USE (EW MODEL)


Adjustment screwdriver (supplied)
Level Control
Power
RCA Level
4V
400mV
DIN Gain
MIN
MAX
❶
❷

❶ Power Indicator
The power indicator lights when the power is switched on.

❷ DIN input gain and RCA input level controls
The DIN input gain and RCA input level controls are used to adjust the DIN input gain and RCA input level, respectively. Set the input selector to suit the type of the car stereo component to be connected.
If this amplifier is connected to a Pioneer car stereo component with DIN sockets, set the DIN gain control to the specified position (•). If the amplifier is connected to a Pioneer car stereo component with RCA pin jacks, set the RCA level control to the specified position (•).
If the amplifier is connected to a non-Pioneer car stereo component with RCA pin jacks, adjust the input level as shown in Fig. A.

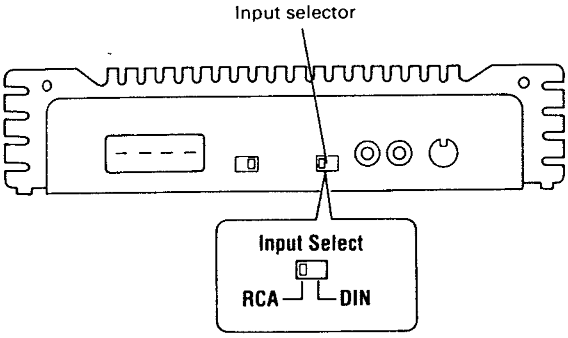

RCA Level
4V
400mV

The position indicated by • represents 0.5 V.

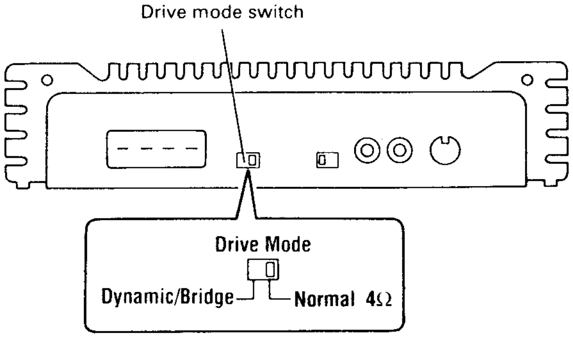
Fig. A

- Adjust control ❷ with the supplied adjustment screwdriver. Keep the screwdriver in case you need to readjust the controls later.

Input selector
Set the input selector to suit the car stereo component connected to the amplifier. To connect the amplifier to a car stereo component with RCA pin jacks, set the input selector to the left side (RCA position). To connect the amplifier to a Pioneer car stereo component with DIN sockets, set the input selector to the right side (DIN position).

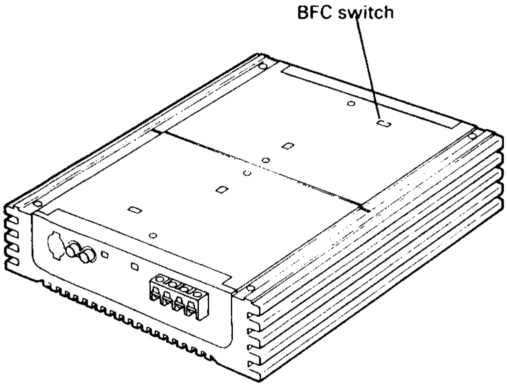

Input selector
Input Select
RCA
DIN

Drive mode switch
If the impedance of the speakers used with the amplifier is 4Ω or more, slide the drive mode switch on the rear of the amplifier to the right (Normal 4Ω). If one channel (mono) is used, or if the speaker impedance is 4Ω or less, slide the switch to the left (Dynamic/Bridge).


Drive mode switch
Drive Mode
Dynamic/Bridge
Normal 4Ω

BFC (Beat Frequency Control) switch

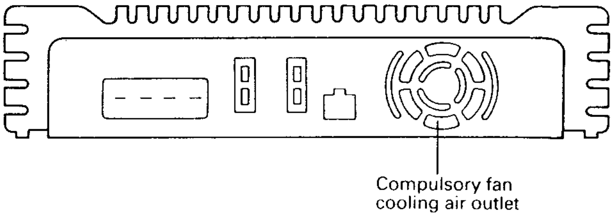
If beating is heard when listening to AM stations on your car radio, change the position of the BFC switch on the bottom of the amplifier with a small flat-bladed screwdriver.



Compulsory fan cooling system

This is a high-power amplifier, so it produces a lot of heat. To keep it cool, it has fan cooling.

- When the power of the car stereo is turned on, the compulsory cooling fan of this power amplifier works automatically and cools inside of this amplifier.
- Install the amplifier so there is enough space front and back to allow the fan cooling to work properly. If the front or back side is covered, the amplifier may malfunction or fail.



5. CONNECTING THE UNITS (EW MODEL)

Connect the components as shown in the diagram.

- Before finalizing installation, turn everything on, and make sure everything works correctly and that no noise is getting into the system.
- When routing leads and cords, secure them with cable retainers and electrician's adhesive tape. Also, to prevent any damage to the insulation on the leads and cords, protect them with electrician's adhesive tape wherever they may touch sharp edges.
- Keep all wiring away from hot surfaces or heater outlets to prevent short circuits.
- It is recommended that the speakers connected to the amplifier have the ratings shown below, or higher. If a speaker has a rating below that recommended, it may be damaged when the volume is turned up. The speaker impedance must be 2 to 8 ohms.

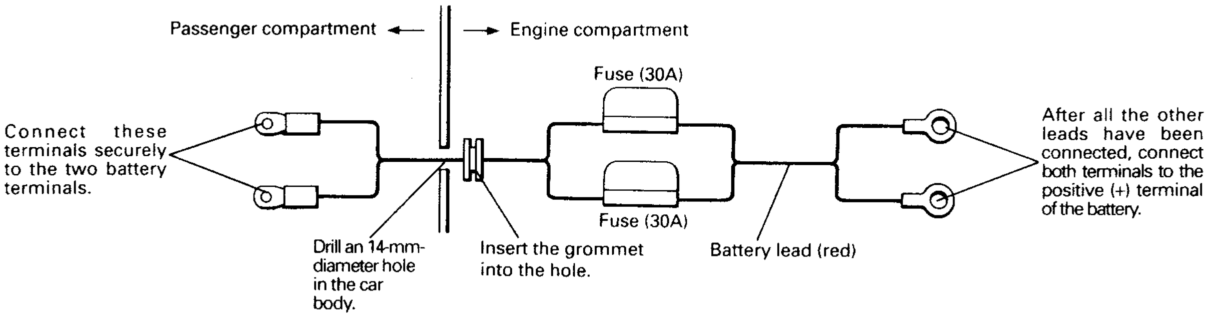
Mode	Speaker ratings	
Two-channel	Maximum	240 W
	Nominal	120 W
One-channel	Maximum	640 W
	Nominal	320 W

In the case of a full-range speaker, use one whose maximum rating is higher than the maximum rating shown. In the case of a sub-woofer, use one whose nominal rating is higher than the nominal rating shown.

- Never connect a speaker lead to ground or to other speaker grounds. The protection circuitry will operate instantaneously, turning off the amplifier.
- To prevent noise problems, keep the power leads to the amplifier away from the signal cords and speaker leads. Also, keep the power leads away from any antenna cords.
- Amplifier ground leads (black) should be connected to a solid metal part of the vehicle body. If using multiple amplifiers, connect all amplifier ground leads to the same point to prevent noise problems. To get good contact when grounding, you may have to sand away the paint to expose the metal underneath.
- To operate the amplifier and car stereo properly, connect the battery lead and the accessory power lead (red/black) correctly. If the leads are not connected correctly or are not connected at all, the amplifier and car stereo will not work.
- To connect the amplifier to the RCA pin jacks of a car stereo component, use an audio cord with RCA pin plugs. To connect the amplifier to the DIN socket of a car stereo component, use a DIN connection cord. Both kinds of cord are available from your dealer.

Connecting the battery lead (red)

Route the positive(+) battery lead (red) from the engine compartment to the passenger compartment before connecting it to the amplifier. To prevent a short circuit, only connect the lead after connecting all the other leads. Connect the two wires of the battery lead securely. If either of them comes loose because of vibration while the car is moving, a short circuit may occur and a fire may break out.

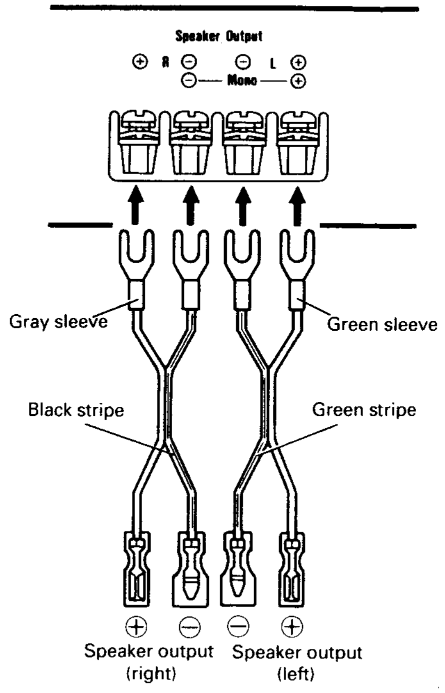

Passenger compartment ←
→ Engine compartment
Fuse (30A)
Fuse (30A)
Connect these terminals securely to the two battery terminals.
After all the other leads have been connected, connect both terminals to the positive (+) terminal of the battery.
Drill an 14-mm-diameter hole in the car body.
Insert the grommet into the hole.
Battery lead (red)

Connecting the leads (supplied)

Connecting the speaker leads

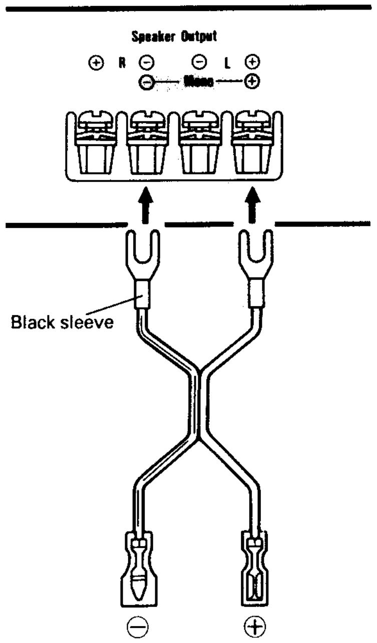
This amplifier can select two-channel output (stereo) or one-channel output (mono). The speaker leads must be connected to suit the mode selected. Connect the speaker leads to the output terminals of the amplifier, paying attention to the polarities (+ and –) and lead colors.

Two-channel mode (stereo)


Speaker Output
⊕ R ⊖ ⊖ L ⊕
⊖— Mono —⊕
Gray sleeve
Green sleeve
Black stripe
Green stripe
⊕ ⊖ ⊖ ⊕
Speaker output (right)
Speaker output (left)

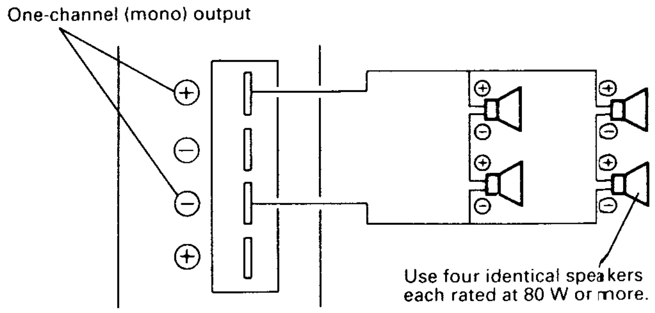
One-channel mode (mono)

- Slide the drive mode switch to the left (Dynamic/Bridge).


Speaker Output
⊕ R ⊖ ⊖ L ⊕
⊖— Mono —⊕
Black sleeve
⊖
⊕

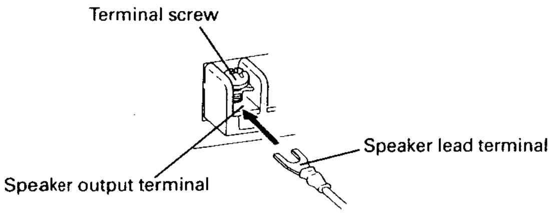
Speakers to be connected to the amplifier for one channel (mono)

If this amplifier is used for one channel (mono), its nominal output is 320 W (640 W max.). To handle this output, four identical speakers with nominal inputs of 80 W or more should be connected as shown below (making the total nominal inputs 320 W or more). The output volume will be greater than when only a single speaker is used.

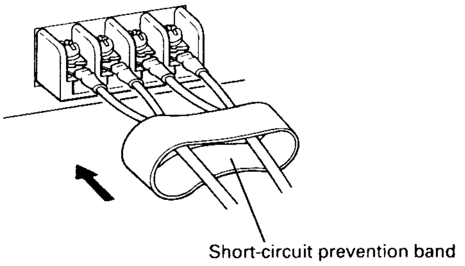

One-channel (mono) output
⊕
⊖
⊖
⊕
Use four identical speakers each rated at 80 W or more.

Speaker lead connection procedure

1. Loosen the four screws of the speaker terminals (Speaker Output) on the rear of the amplifier.
2. Insert the end of each speaker lead between the speaker terminal and its screw according to the mode to be used, and tighten the screw.

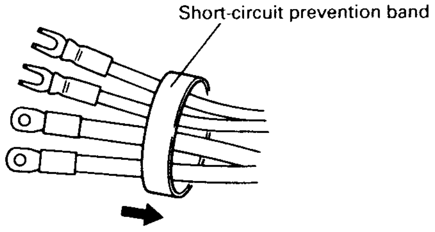

Terminal screw
Speaker lead terminal
Speaker output terminal

3. Cover each terminal block with a short-circuit prevention band.
   - This band *must* be used.

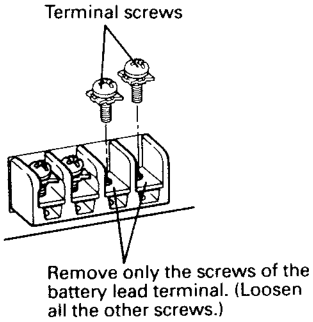

Short-circuit prevention band

Connection of the battery power, and ground leads

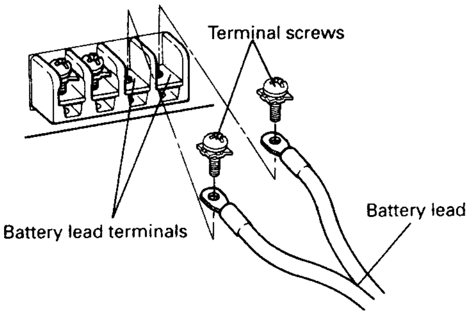
1. Pass the leads through the band for preventing short circuits.
   - This band *must* be used.


Short-circuit prevention band

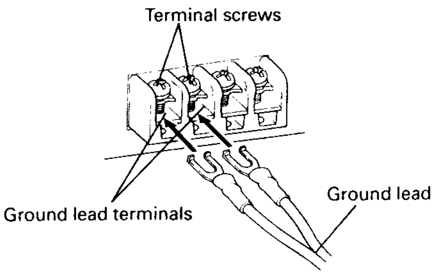
2. Loosen the screws (× 2) of the terminals on the front panel of the amplifier.
   - Remove the screws (× 2) from the two battery power terminals.


Terminal screws
Remove only the screws of the battery lead terminal. (Loosen all the other screws.)

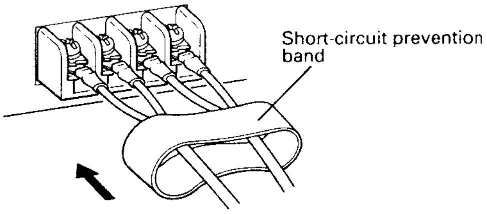
3. Connect the battery lead to the two battery lead terminals, reinserting and tightening the screws (× 2).


Terminal screws
Battery lead
Battery lead terminals

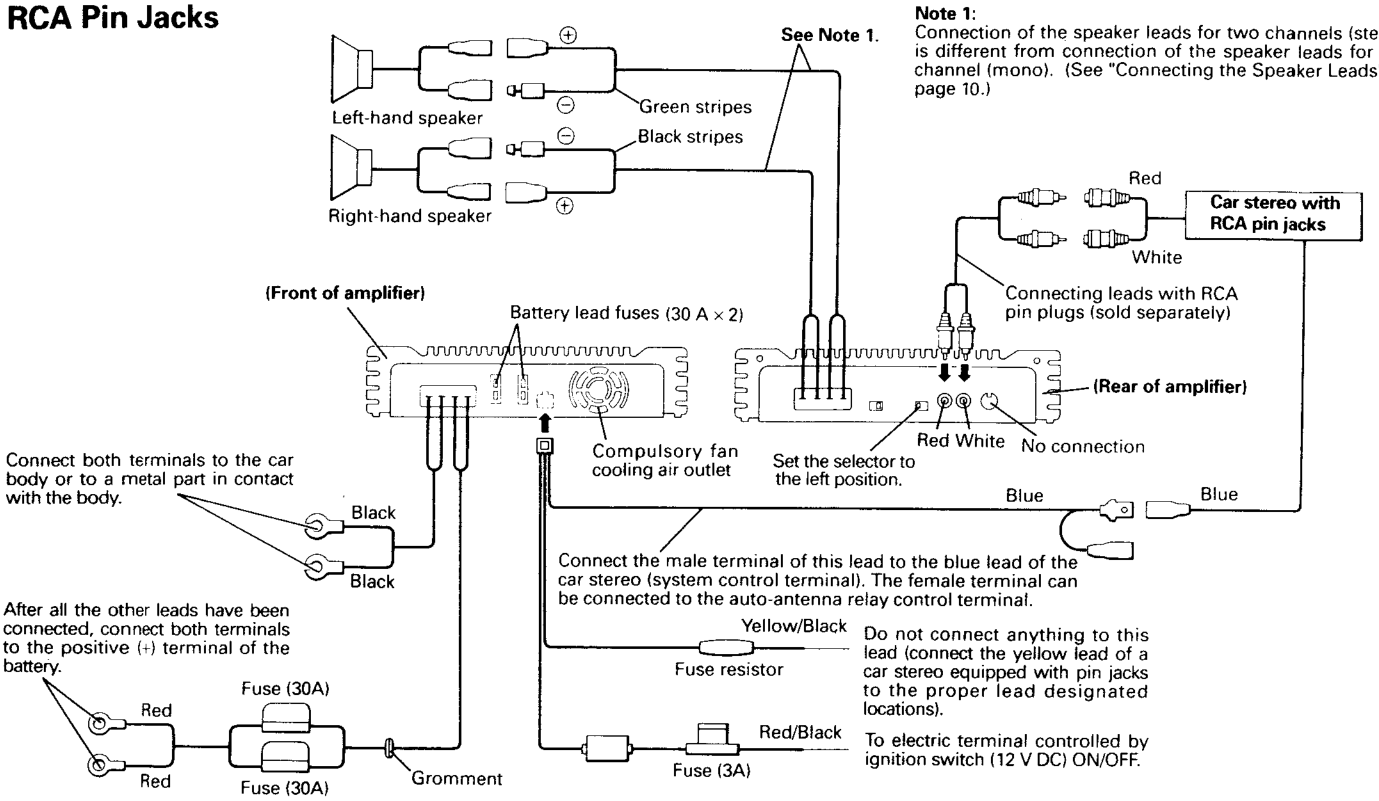
4. Connect the ground lead to the two ground lead terminals, tightening the screws.


Terminal screws
Ground lead
Ground lead terminals

5. Slide the short-circuit prevention band over the terminals.


Short-circuit prevention band

When Combined with a Car Stereo with RCA Pin Jacks


See Note 1.
Left-hand speaker
Green stripes
Black stripes
Right-hand speaker
Red
White
Car stereo with RCA pin jacks
(Front of amplifier)
Battery lead fuses (30 A × 2)
(Rear of amplifier)
Red
White
No connection
Compulsory fan cooling air outlet
Blue
Blue
Black
Black
Yellow/Black
Fuse resistor
Fuse (30A)
Red
Red
Fuse (30A)
Gromment
Red/Black
Fuse (3A)

Note 1:
Connection of the speaker leads for two channels (stereo) is different from connection of the speaker leads for one channel (mono). (See "Connecting the Speaker Leads" on page 10.)

Connecting leads with RCA pin plugs (sold separately)

Set the selector to the left position.

Connect both terminals to the car body or to a metal part in contact with the body.

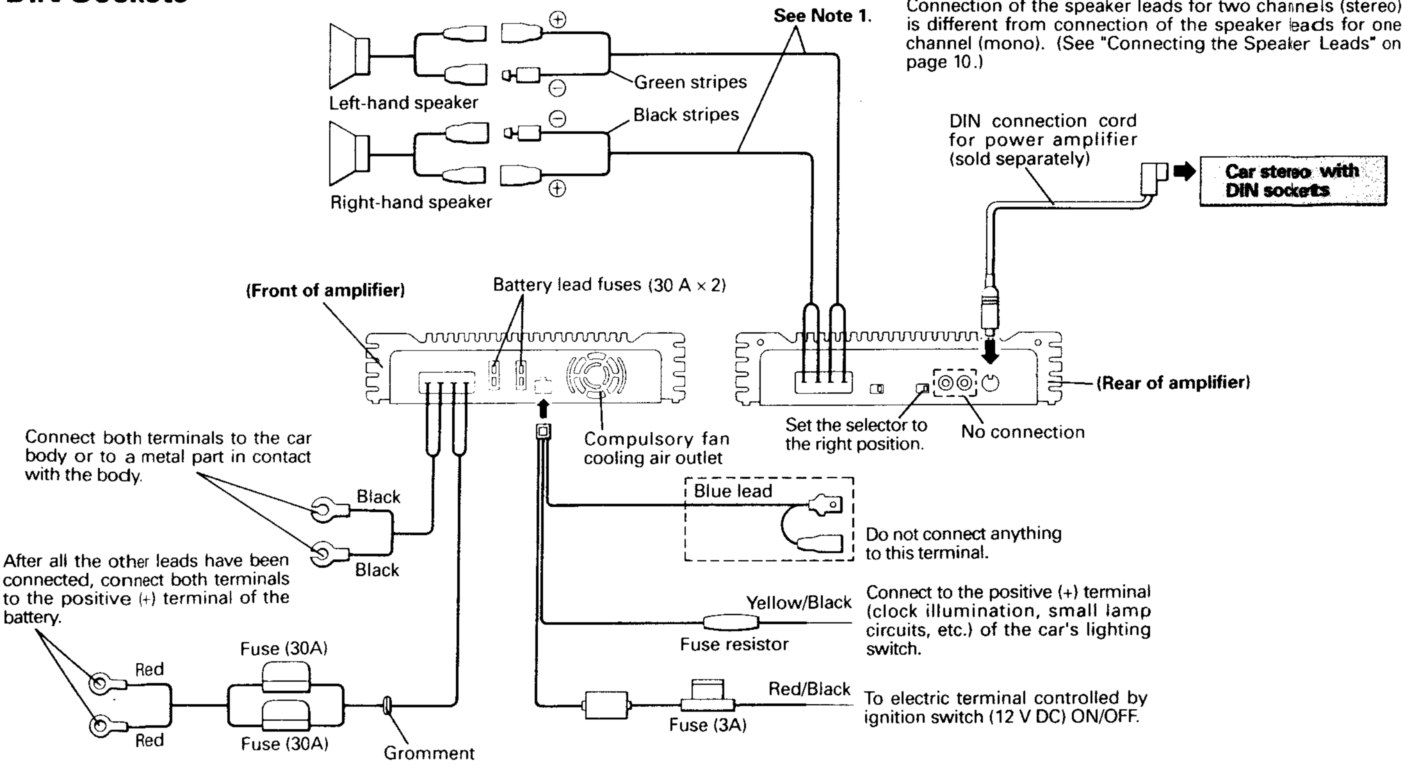
Connect the male terminal of this lead to the blue lead of the car stereo (system control terminal). The female terminal can be connected to the auto-antenna relay control terminal.

After all the other leads have been connected, connect both terminals to the positive (+) terminal of the battery.

Do not connect anything to this lead (connect the yellow lead of a car stereo equipped with pin jacks to the proper lead designated locations).

To electric terminal controlled by ignition switch (12 V DC) ON/OFF.

When Combined with a Car Stereo with DIN Sockets


See Note 1.
Left-hand speaker
Green stripes
Black stripes
Right-hand speaker
Car stereo with DIN sockets
(Front of amplifier)
Battery lead fuses (30 A × 2)
(Rear of amplifier)
No connection
Compulsory fan cooling air outlet
Blue lead
Black
Black
Yellow/Black
Fuse resistor
Fuse (30A)
Red
Red
Fuse (30A)
Gromment
Red/Black
Fuse (3A)

Note 1:
Connection of the speaker leads for two channels (stereo) is different from connection of the speaker leads for one channel (mono). (See "Connecting the Speaker Leads" on page 10.)

DIN connection cord for power amplifier (sold separately)

Set the selector to the right position.

Connect both terminals to the car body or to a metal part in contact with the body.

Do not connect anything to this terminal.

After all the other leads have been connected, connect both terminals to the positive (+) terminal of the battery.

Connect to the positive (+) terminal (clock illumination, small lamp circuits, etc.) of the car's lighting switch.

To electric terminal controlled by ignition switch (12 V DC) ON/OFF.

6. DISASSEMBLY

● Remove the Case

1. Remove the four screws A and remove the two cases.

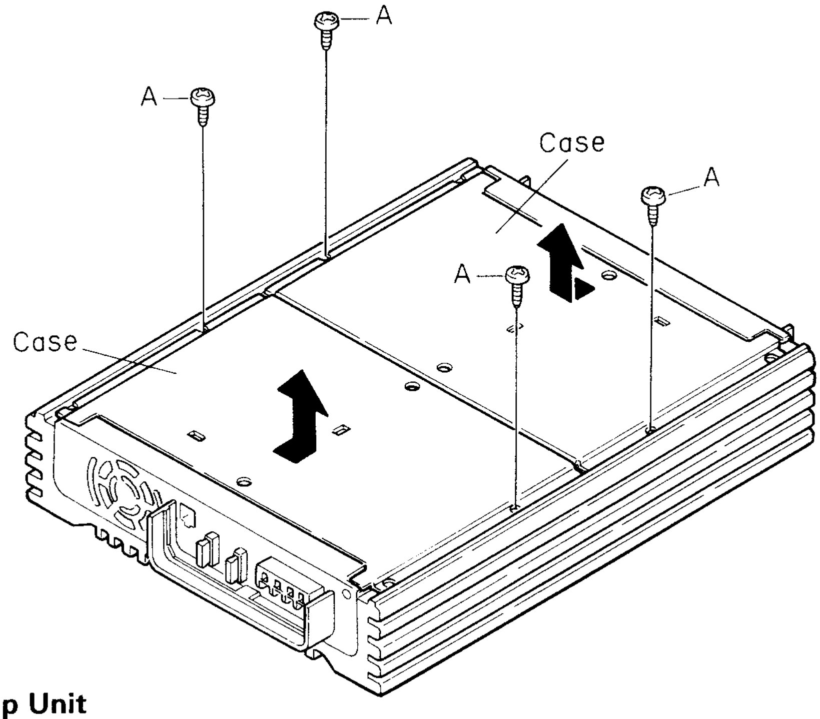

A
A
Case
A
A
Case

Fig. 1

● Remove the Amp Unit

1. Remove the two screws B and remove the front panel.
2. Remove the two screws C and remove the rear panel.
3. Remove the four screws D and thirteen screws E.
4. Remove the Amp Unit.

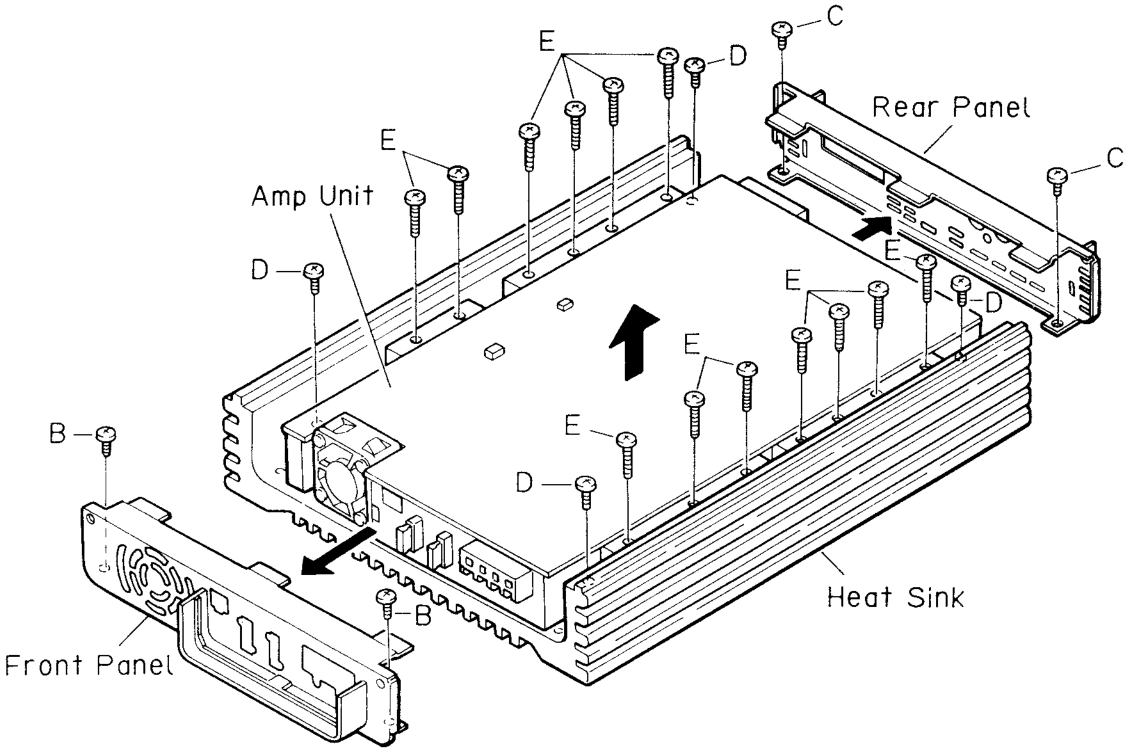

E
C
D
Rear Panel
C
E
Amp Unit
D
E
E
D
E
E
B
E
D
Heat Sink
B
Front Panel

Fig. 2

Remove the Bracket

1. Remove the screw F and remove the LED Assy.
2. Remove the three screws G and remove the bracket.

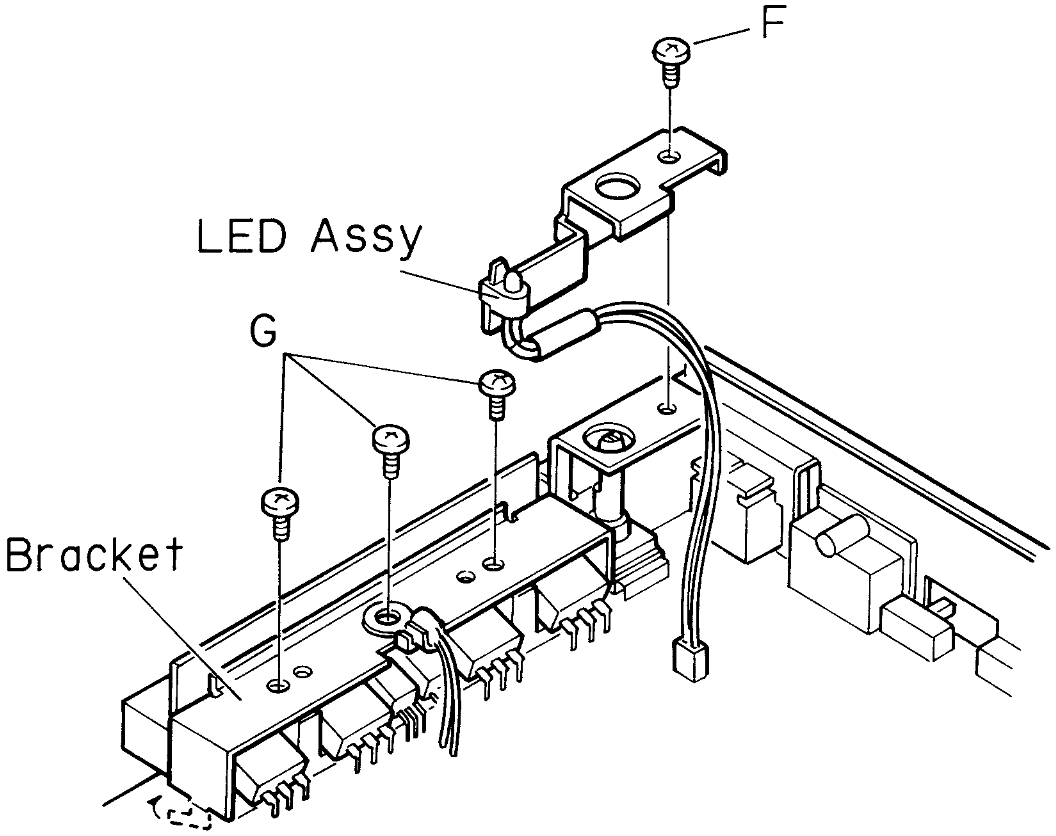


Fig. 3

Attention points for disassembling

- The screw of ground terminal cannot be removed. Don't loosen forcibly.
- After removing the amplifier unit, put the amplifier unit on the heat sink being faced down. When the amplifier unit on the audio circuit side (The side fixed by four screws) is fixed using the screw, the test at full power can be done for approx, 20 minutes.

7. CIRCUIT DESCRIPTION

- **Isolator circuit**
  The differential amplification circuit, which is usually combined with the operational amplifier and the resistance network, is arranged to the dedicated IC.
  The ripple removal ratio is further improved than the conventional differential amplification circuit.

- **Non-switching circuit type Ⅲ**
  By adding Q429 to Q432, distortion removal capacity is improved.

- **PWM POWER SUPPLY (Voltage detection circuit for both positive and negative voltage.)**
  The PWM power supply is a circuit that maintains stable secondary voltage in a DC-DC converter, regardless of the voltage fluctuation and load fluctuation of the primary voltage.
  Former PWM power supply detected and controlled only positive voltage of DC-DC converter. New PWM power supply increases output in the lower range through detecting and controlling both positive and nagative voltages and it creates a higher fidelity sound.
  (Manufacture the current mirror using Q114 and Q115, and input $-V_H$ into the pin 16 of IC101 through Q116. $+V_H$ is input through Q117. R131 to R134 are the voltage dividers.)

- **Troidal transformer and others**
  To improve efficiency and to delete the leakage flux, the "doughnut" type transformar is adopted. And corresponding to current increment, two fuse, choke coil parallel combinations. (L101, L102)

- **DC servo**
  To reduce the DC component appeared in the output, DC is fed back by means of IC201 and IC202. This circuit performs the low-pass feed back of less than 200Hz simultaneously.

- **In this unit, the mode selecting circuit was simplified in the following manners.**

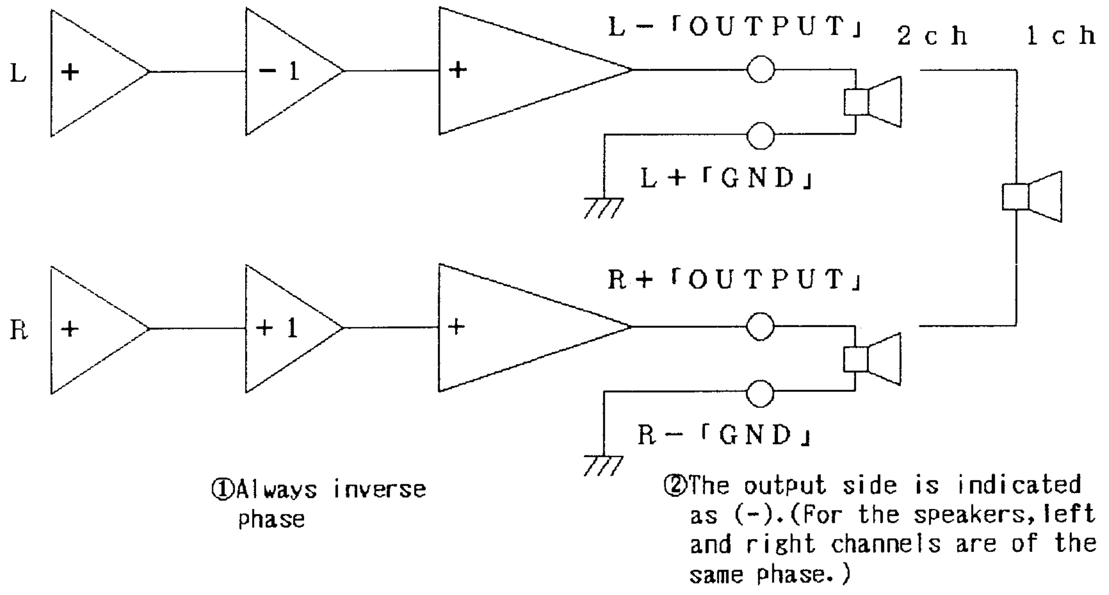

L
+
－1
+
L－「OUTPUT」
2ch
1ch
L＋「GND」
R
+
＋1
+
R＋「OUTPUT」
R－「GND」
①Always inverse phase
②The output side is indicated as (－).(For the speakers, left and right channels are of the same phase.)

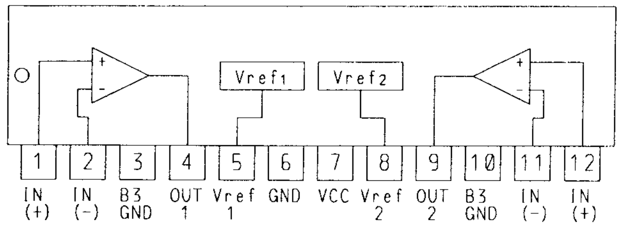
Fig. 4

Figure shows the case of UC, EW carries out ① and ② on the right channel.
For the above two reasons, a signal selector switch was eliminated.

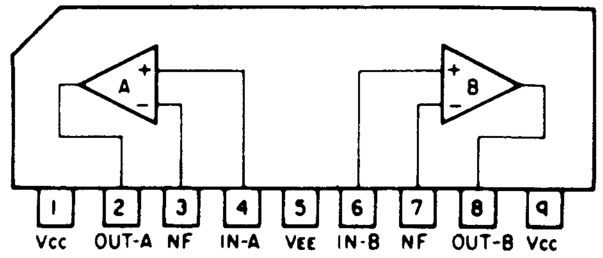
When you make a test, take care not to short-circuit (OUTPUT) and (GND). Especially when you measure two channels at the same time, a great care must be taken because short-circuit is susceptible to take place at the measuring instrument.

- **ICs**

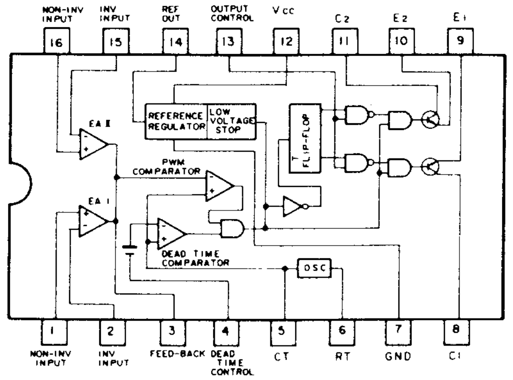
TA8181SN


Vref1
Vref2
1 2 3 4 5 6 7 8 9 10 11 12
IN (+)
IN (-)
B3 GND
OUT 1
Vref 1
GND
VCC
Vref 2
OUT 2
B3 GND
IN (-)
IN (+)

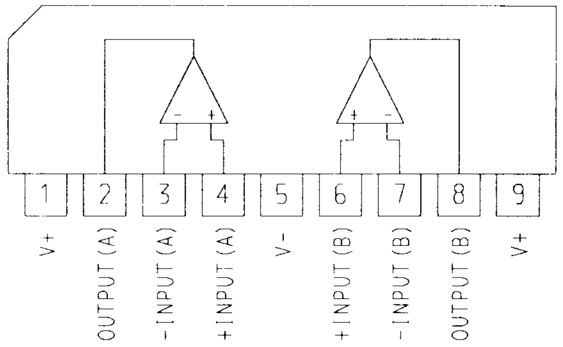
NJM2068S


A
B
1 2 3 4 5 6 7 8 9
Vcc
OUT-A
NF
IN-A
VEE
IN-B
NF
OUT-B
Vcc

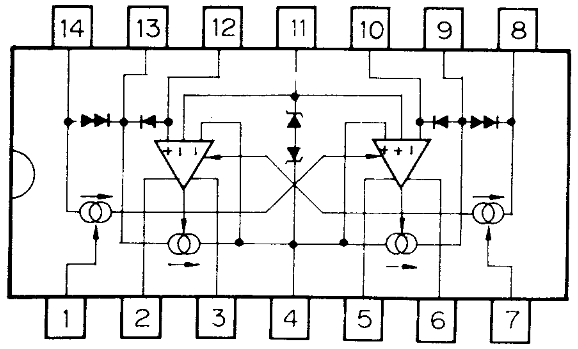
UPC494C


NON-INV INPUT
INV INPUT
REF OUT
OUTPUT CONTROL
Vcc
C2
E2
E1
16 15 14 13 12 11 10 9
REFERENCE REGULATOR
LOW VOLTAGE STOP
FLIP-FLOP
PWM COMPARATOR
DEAD TIME COMPARATOR
OSC
EA2
EA1
1 2 3 4 5 6 7 8
NON-INV INPUT
INV INPUT
FEED-BACK
DEAD TIME CONTROL
CT
RT
GND
C1

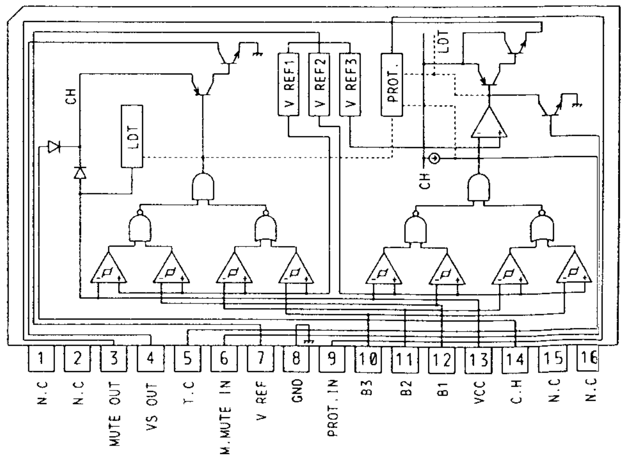
NJM5532S


1 2 3 4 5 6 7 8 9
V+
OUTPUT (A)
-INPUT (A)
+INPUT (A)
V-
+INPUT (B)
-INPUT (B)
OUTPUT (B)
V+

PA0016


14 13 12 11 10 9 8
+1
+1
1 2 3 4 5 6 7

TA8194Z


CH
V REF1
V REF2
V REF3
PROT
LDT
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
N.C
N.C
MUTE OUT
VS OUT
T.C
M.MUTE IN
V REF
GND
PROT.IN
B3
B2
B1
VCC
C.H
N.C
N.C

and Q115, and
h Q116. $+V_H$ is
ltage dividers.)

akage flux, the
d. And corre-
hoke coil paral-

he output, DC is
)2. This circuit
an 200Hz simul-

c h

]

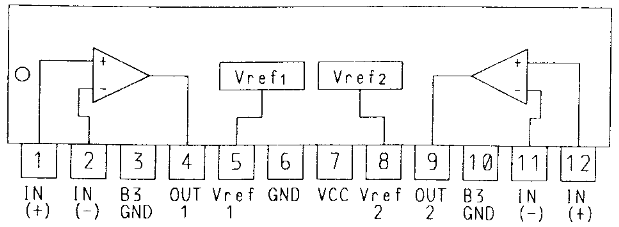
ed
eft
the

Fig. 4

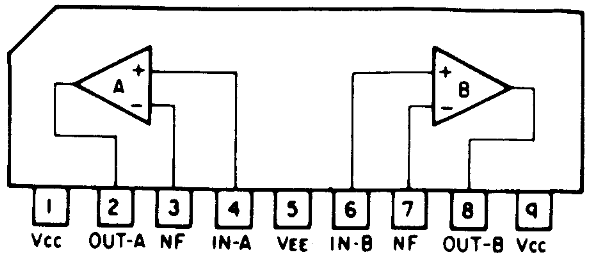
to short-circuit
u measure two
must be taken
e place at the

• ICs

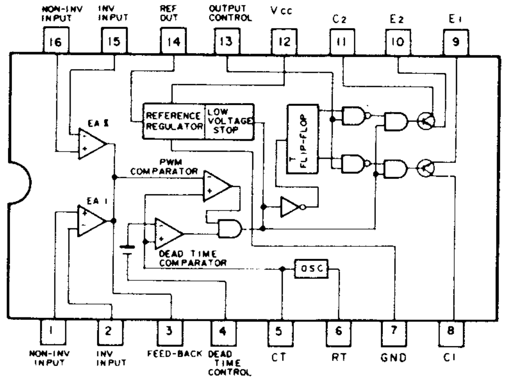
TA8181SN


Vref1
Vref2
1 IN (+)
2 IN (-)
3 B3 GND
4 OUT 1
5 Vref 1
6 GND
7 VCC
8 Vref 2
9 OUT 2
10 B3 GND
11 IN (-)
12 IN (+)

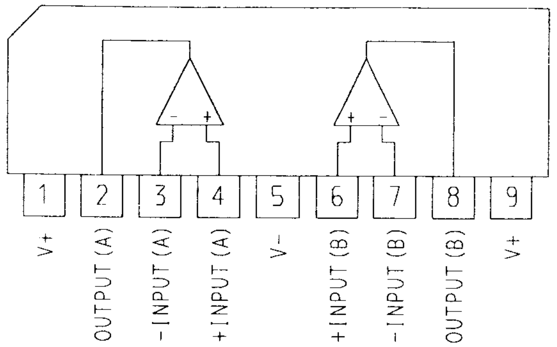
NJM2068S


A
B
1 Vcc
2 OUT-A
3 NF
4 IN-A
5 VEE
6 IN-B
7 NF
8 OUT-B
9 Vcc

UPC494C

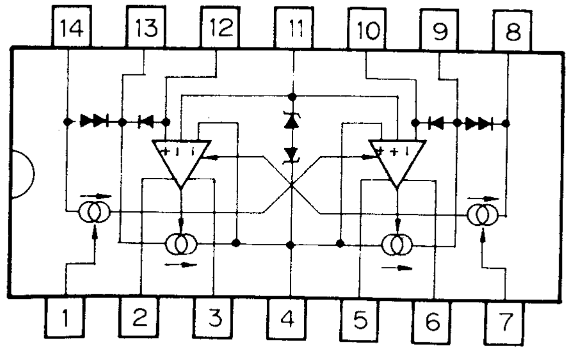

16 NON-INV INPUT
15 INV INPUT
14 REF OUT
13 OUTPUT CONTROL
12 Vcc
11 C2
10 E2
9 E1
EA II
EA I
REFERENCE REGULATOR
LOW VOLTAGE STOP
FLIP-FLOP
T
PWM COMPARATOR
DEAD TIME COMPARATOR
OSC
1 NON-INV INPUT
2 INV INPUT
3 FEED-BACK
4 DEAD TIME CONTROL
5 CT
6 RT
7 GND
8 C1

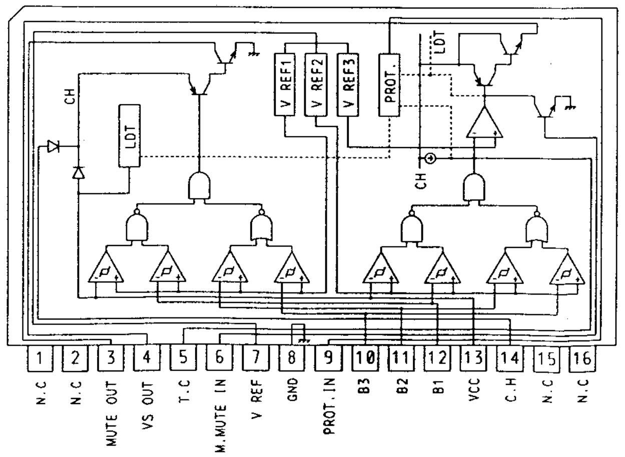
NJM5532S


1 V+
2 OUTPUT (A)
3 -INPUT (A)
4 +INPUT (A)
5 V-
6 +INPUT (B)
7 -INPUT (B)
8 OUTPUT (B)
9 V+

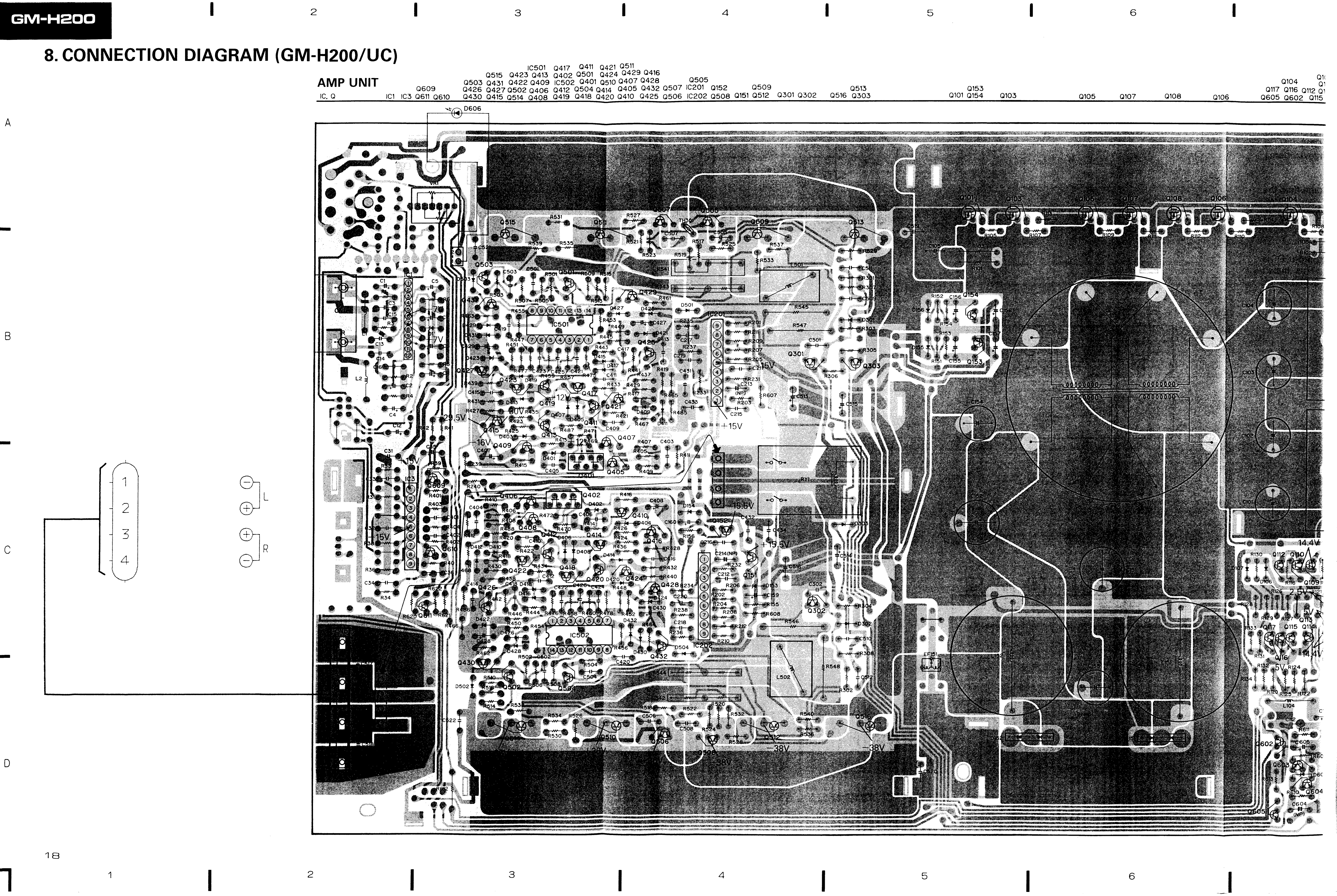
TA8194Z

PA0016


14
13
12
11
10
9
8
1
2
3
4
5
6
7


CH
LDT
V REF1
V REF2
V REF3
PROT.
LDT
CH
1 N.C
2 N.C
3 MUTE OUT
4 VS OUT
5 T.C
6 M.MUTE IN
7 V REF
8 GND
9 PROT. IN
10 B3
11 B2
12 B1
13 VCC
14 C.H
15 N.C
16 N.C

8. CONNECTION DIAGRAM (GM-H200/UC)


1
2
3
4
5
6
A
B
C
D
AMP UNIT
IC. Q
IC1
IC3
Q609 Q611 Q610
Q503 Q426 Q430
Q515 Q431 Q427 Q415
Q423 Q422 Q502 Q514
IC501 Q413 Q409 Q406 Q408
Q417 Q402 IC502 Q412 Q419
Q411 Q501 Q401 Q504 Q418
Q421 Q424 Q510 Q414 Q420
Q511 Q429 Q407 Q405 Q410
Q416 Q428 Q432 Q425
Q507 Q506
Q505 IC201 IC202
Q152 Q508
Q151
Q509 Q512
Q301 Q302
Q516
Q513 Q303
Q101
Q153 Q154
Q103
Q105
Q107
Q108
Q106
Q104 Q117 Q116 Q605 Q602
Q112 Q115
D606
IC501
IC502
IC201
IC202
IC1
IC3
VR1
RY1
L501
L502
+15V
-15V
+12V
-12V
29.5V
-16V
60V
15.5V
-15.5V
-38V
-26V
14.4V
2.5V
5V
1
2
3
4
L
R
+
−

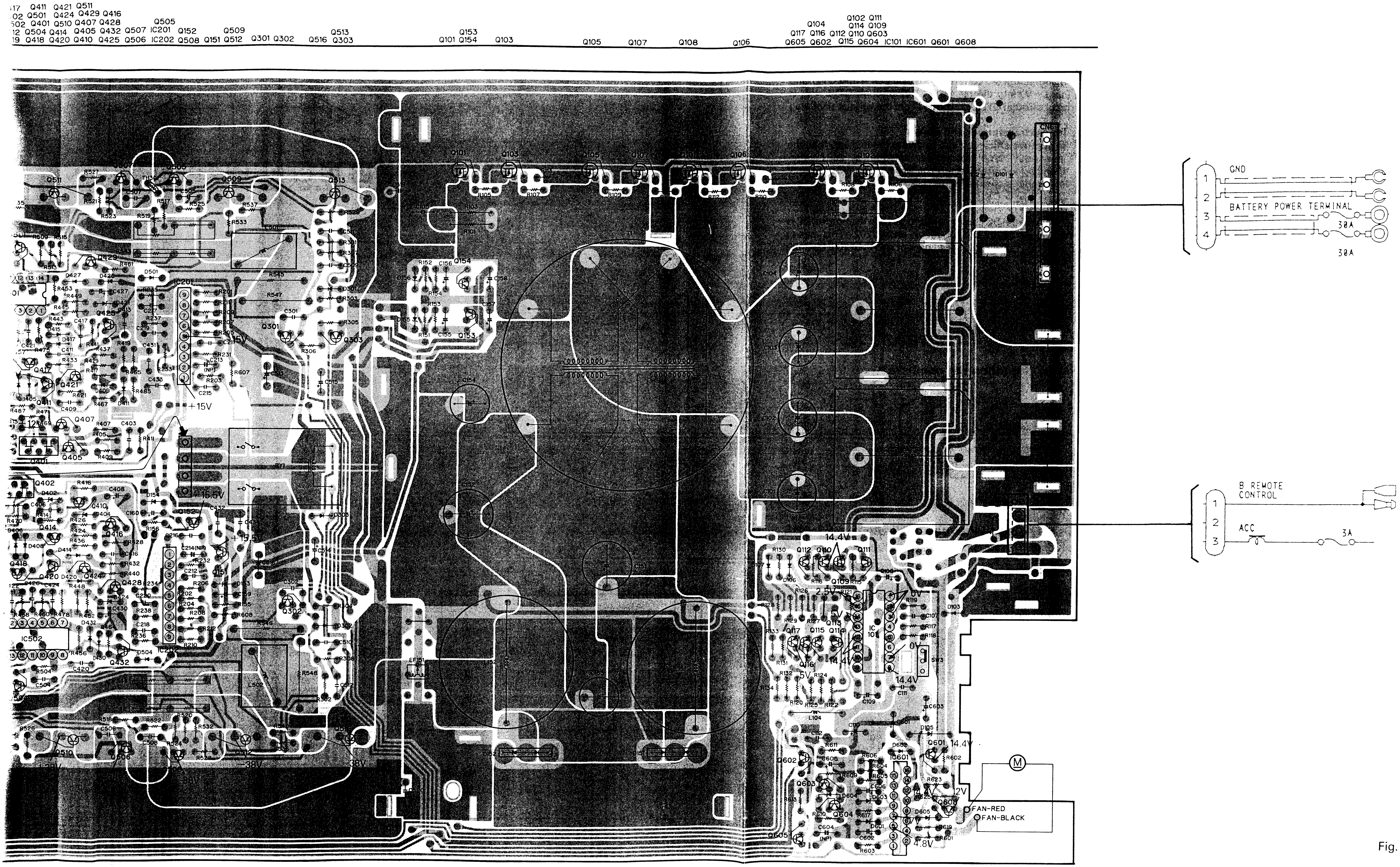
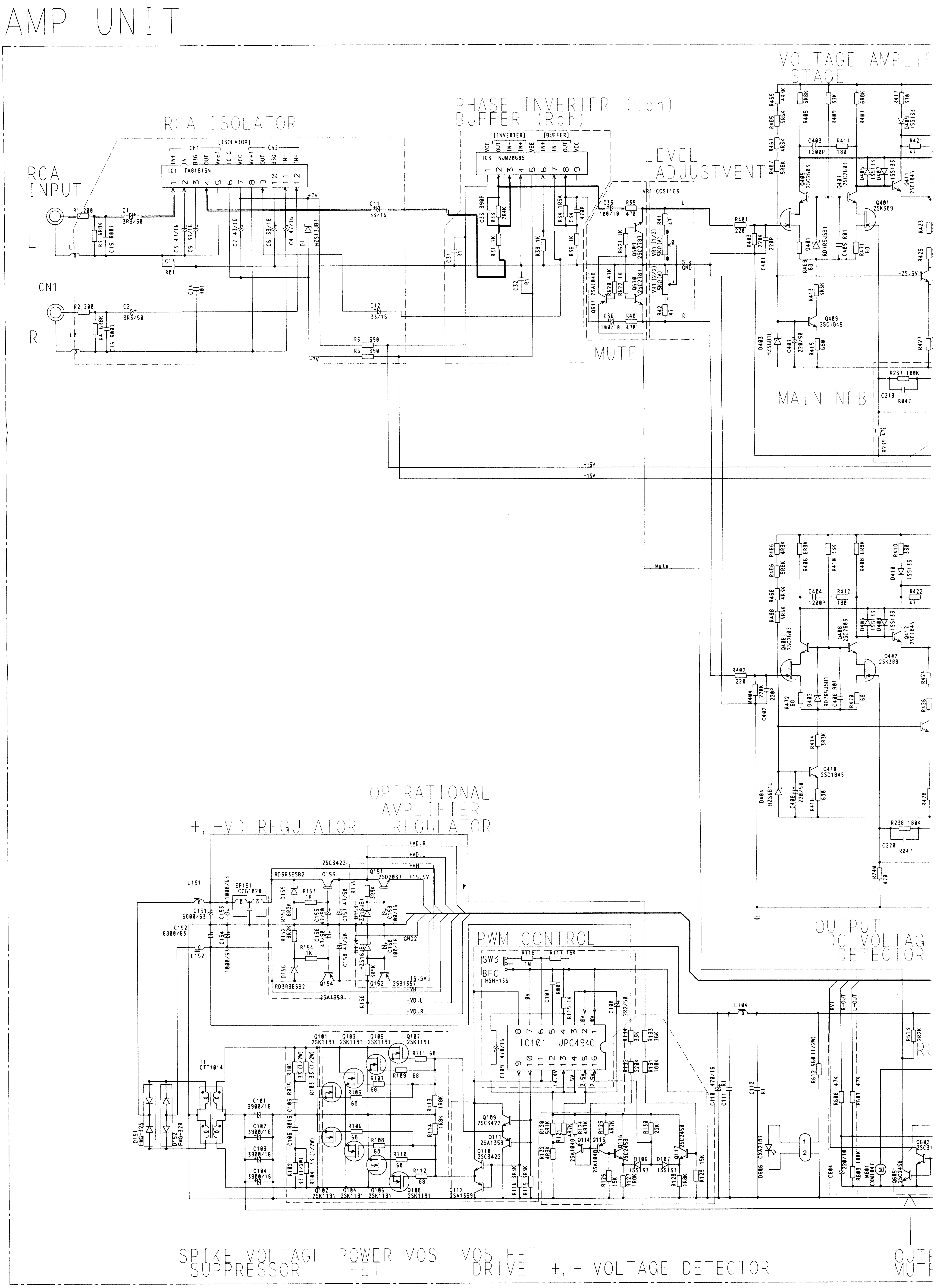
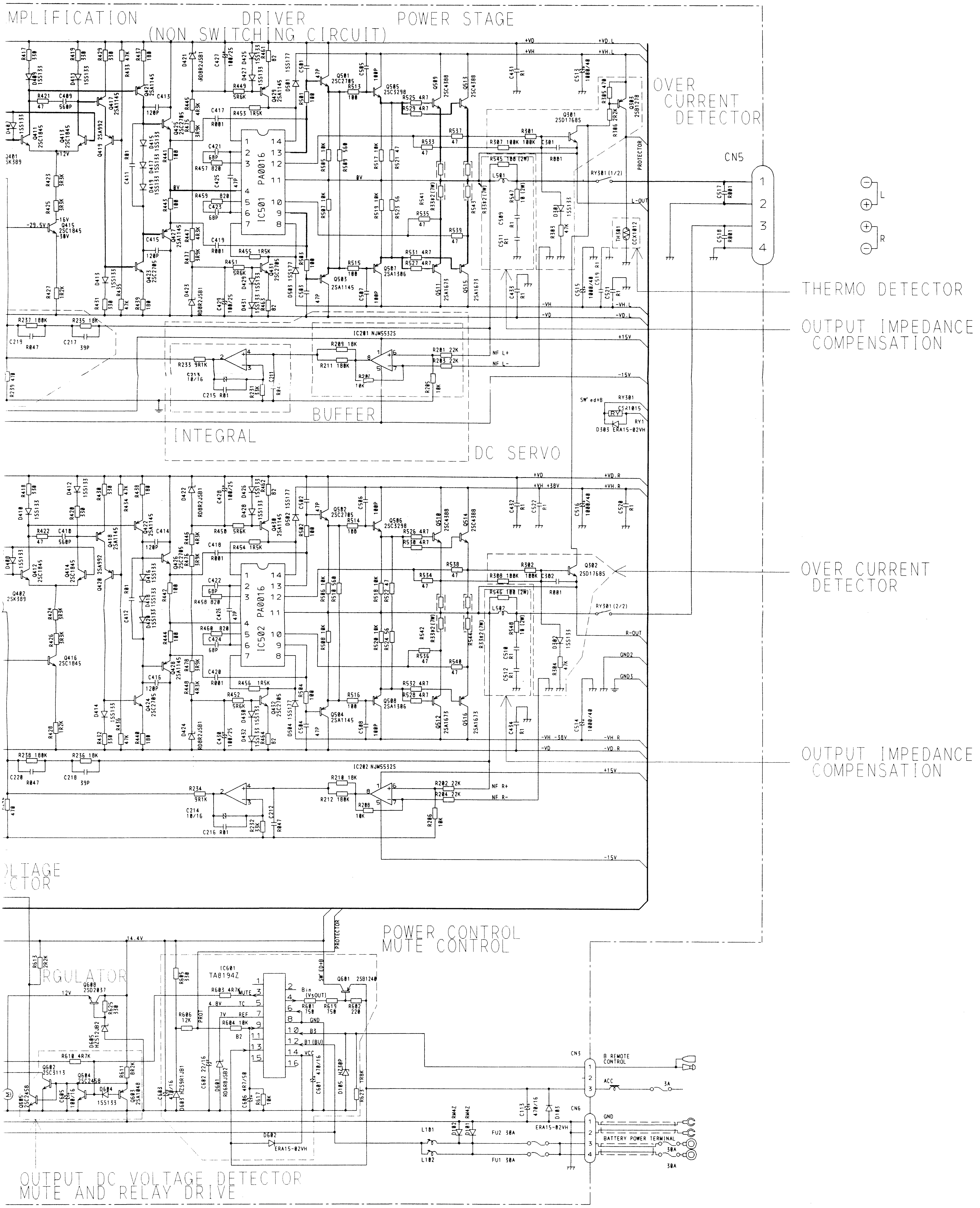

4
5
6
7
8
9
A
B
C
D
Q411 Q421 Q511
Q501 Q424 Q429 Q416
Q401 Q510 Q407 Q428
Q504 Q414 Q405 Q432 Q507
Q418 Q420 Q410 Q425 Q506
Q505
IC201 Q152 Q509
IC202 Q508 Q151 Q512
Q301 Q302
Q513
Q516 Q303
Q153
Q101 Q154
Q103
Q105
Q107
Q108
Q106
Q104
Q117 Q116 Q112
Q605 Q602 Q115
Q102 Q111
Q114 Q109
Q110 Q603
Q604 IC101 IC601 Q601 Q608
GND
1
2
3
4
BATTERY POWER TERMINAL
30A
30A
B REMOTE
CONTROL
1
2
3
ACC
3A
+15V
+15V
+15.5V
−15.5V
14.4V
2.5V
5V
0V
14.4V
14.4V
4.8V
12V
−38V
−38V
M
FAN-RED
FAN-BLACK
SW3
IC502
L104
L502
EF151
CN601

Fig. 5

9. SCHEMATIC CIRCUIT DIAGRAM (GM-H200/UC)


AMP UNIT
RCA ISOLATOR
RCA INPUT
L
R
CN1
IC1 TA8181SN
PHASE INVERTER (Lch)
BUFFER (Rch)
IC3 NJM2068S
LEVEL ADJUSTMENT
VR1 CCS1183
MUTE
VOLTAGE AMPLIFI
STAGE
MAIN NFB
+15V
-15V
Mute
OPERATIONAL AMPLIFIER REGULATOR
+, -VD REGULATOR
PWM CONTROL
IC101 UPC494C
SW3 BFC HSH-156
OUTPUT DC VOLTAGE DETECTOR
SPIKE VOLTAGE SUPPRESSOR
POWER MOS FET
MOS FET DRIVE
+, - VOLTAGE DETECTOR
T1 CTT1014
+VD.R
+VD.L
+VH
+15.5V
-15.5V
-VH
-VD.L
-VD.R
GND2
NOTE


MPLIFICATION
DRIVER
(NON SWITCHING CIRCUIT)
POWER STAGE
OVER CURRENT DETECTOR
CN5
IC501 PA0016
IC502 PA0016
THERMO DETECTOR
OUTPUT IMPEDANCE COMPENSATION
IC201 NJM5532S
IC202 NJM5532S
BUFFER
INTEGRAL
DC SERVO
OVER CURRENT DETECTOR
OUTPUT IMPEDANCE COMPENSATION
RY301
L-OUT
R-OUT
L
R
+VD
+VH
-VH
-VD
+15V
-15V
NF L+
NF L-
NF R+
NF R-
PROTECTOR
OLTAGE
CTOR
RGULATOR
POWER CONTROL
MUTE CONTROL
IC601 TA8194Z
CN3
B REMOTE CONTROL
ACC
3A
CN6
GND
BATTERY POWER TERMINAL
FU2 30A
FU1 30A
30A
L101
L102
OUTPUT DC VOLTAGE DETECTOR
MUTE AND RELAY DRIVE
A
B
C
D
E
F

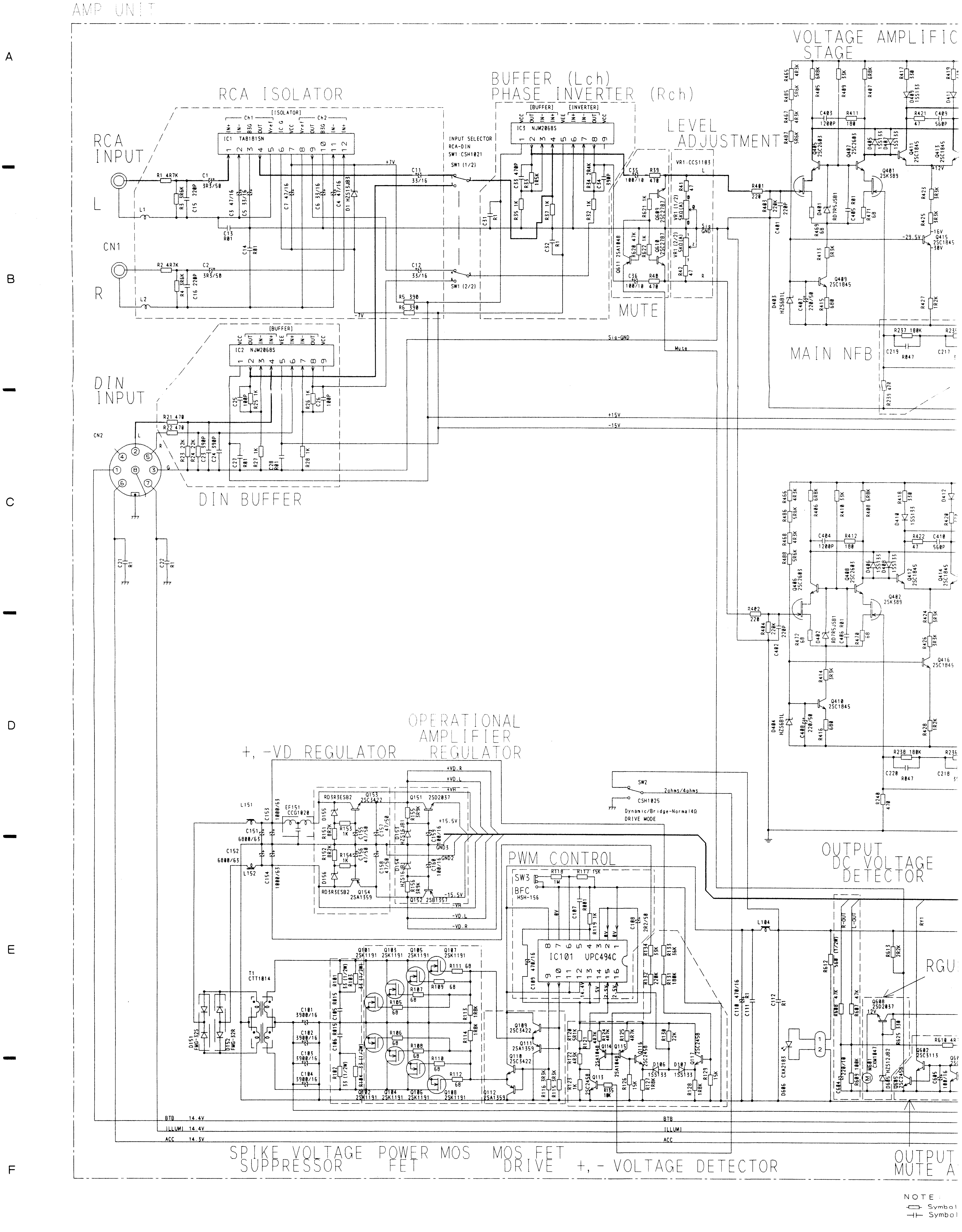
NOTE:
⊏⊐ Symbol indicates a resistor.
⊣⊢ Symbol indicates a capacitor.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

SWITCH:
AMP UNIT
SW3: BFC SWITCH ································ LOW-HIGH
The underlined indicates the switch position.

Fig. 6

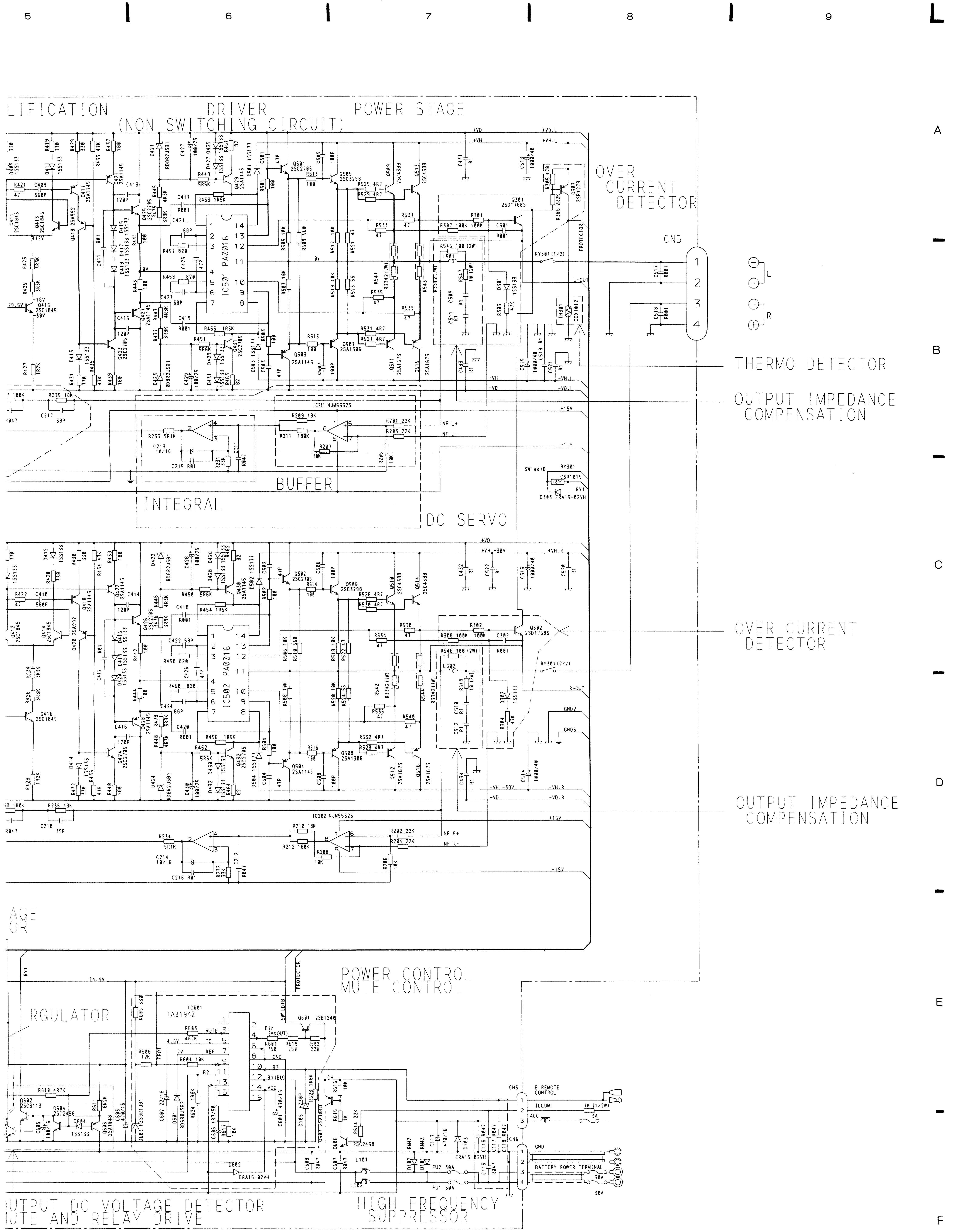
10. SCHEMATIC CIRCUIT DIAGRAM (GM-4200/EW)


AMP UNIT
2
3
4
5
A
B
C
D
E
F
RCA ISOLATOR
[ISOLATOR]
Ch1
Ch2
IC1 TA8181SN
RCA INPUT
L
R
CN1
R1 4R7K
C1 3R3/50
R2 4R7K
C2 3R3/50
R3 3R6K
R4 3R6K
C15 220P
C16 220P
L1
L2
C13 R01
C14 R01
C3 47/16
C5 33/16
C7 47/16
C6 33/16
C4 47/16
D1 HZS13JB3
+7V
-7V
BUFFER (Lch)
PHASE INVERTER (Rch)
[BUFFER]
[INVERTER]
IC3 NJM2068S
INPUT SELECTOR
RCA-DIN
SW1 CSH1021
SW1 (1/2)
SW1 (2/2)
C11 33/16
C12 33/16
R5 390
R6 390
C33 470P
R33 1K5K
R34 2R4K
C34 390P
R35 1K
R37 1K
R32 1K
C31 R1
C32 R1
LEVEL ADJUSTMENT
VR1 CCS1103
VR1 (1/2) 5K0(A)
VR1 (2/2) 5K0(A)
R41 47
R42 47
C35 100/10
R39 470
C36 100/10
R40 470
Q609 2SC2787
Q610 2SC2787
Q611 2SA1048
R620 47K
R621 1K
R622 1K
MUTE
Sig GND
Sig-GND
Mute
DIN INPUT
CN2
IC2 NJM2068S
R21 470
R22 470
R23 22K
R24 22K
C23 390P
C24 390P
C25 100P
R25 1K
R26 1K
C26 100P
C27 R01
R27 1K
C28 R01
R28 1K
C21 R1
C22 R1
DIN BUFFER
+15V
-15V
VOLTAGE AMPLIFIC
STAGE
R465 4R3K
R485 5R6K
R467 4R3K
R487 5R6K
R405 6R8K
R409 33K
R407 6R8K
R417 330
R419
C403 1200P
R411 100
R421 47
C409 560P
Q405 2SC2603
Q407 2SC2603
D405 1SS133
Q411 2SC1845
Q413 2SC1845
Q401 2SK389
R401 220
R403 220K
C401 220P
D401 RD7R5JSB1
C405 R01
R471 68
R469 68
R423 3R3K
R425 3R3K
Q415 2SC1845
-29.5V
R413 3R3K
Q409 2SC1845
D403 HZS6B1L
C407 220/50
R415 680
R427 1R2K
MAIN NFB
R237 100K
C219 R047
C217
R239 470
R466 4R3K
R486 5R6K
R468 4R3K
R488 5R6K
R406 6R8K
R410 33K
R408 6R8K
R418 330
D410 1SS133
D412
C404 1200P
R412 100
R422 47
C410 560P
Q406 2SC2603
Q408 2SC2603
D406 1SS133
Q412 2SC1845
Q414 2SC1845
Q402 2SK389
R402 220
R404 220K
C402 220P
D402 RD7R5JSB1
C406 R01
R472 68
R470 68
R424 3R3K
R426 3R3K
Q416 2SC1845
R414 3R3K
Q410 2SC1845
D404 HZS6B1L
C408 220/50
R416 680
R428 1R2K
R238 100K
C220 R047
C218
R240 470
OPERATIONAL AMPLIFIER REGULATOR
+, -VD REGULATOR
+VD.R
+VD.L
+VH
-VH
-VD.L
-VD.R
L151
L152
C151 6800/63
C152 6800/63
C153 1000/63
C154 1000/63
EF151 CCG1020
RD3R3ESB2
D155
D156
Q153 2SC3422
Q154 2SA1359
R151 8R2K
R152 8R2K
R153 1K
R154 1K
C155 47/50
C156 47/50
C157 47/50
C158 47/50
Q151 2SD2037
Q152 2SB1357
R155 3R9K
R156 3R9K
D153
D154 HZS6B1L
C159 100/16
C160 100/16
+15.5V
-15.5V
GND3
GND2
SW2
2ohms/4ohms
CSH1025
Dynamic/Bridge-Normal4Ω
DRIVE MODE
PWM CONTROL
SW3
BFC
HSH-156
R118 1M
R117 15K
C107
R119 1K
C108 2R2/50
IC101 UPC494C
C109 470/16
R134 33K
R133 36K
R132 220K
R131 180K
OUTPUT DC VOLTAGE DETECTOR
T1 CTT1014
D151 FMG-32S
D152 FMG-32R
C101 3900/16
C102 3900/16
C103 3900/16
C104 3900/16
Q101 2SK1191
Q103 2SK1191
Q105 2SK1191
Q107 2SK1191
Q102 2SK1191
Q104 2SK1191
Q106 2SK1191
Q108 2SK1191
R101 33 (1/2W)
R102 33 (1/2W)
R103 33 (1/2W)
R104 33 (1/2W)
R105 68
R106 68
R107 68
R108 68
R109 68
R110 68
R111 68
R112 68
R113 1R8K
R114 1R8K
Q109 2SC3422
Q110 2SC3422
Q111 2SA1359
Q112 2SA1359
R116 3R3K
R115 3R3K
R120 5R1K
R122 4R3K
R123 4R7K
R125 4R7K
Q114 2SA1048
Q115 2SC2458
Q116 2SC2458
Q113 2SC2458
R130 22K
D106 1SS133
D107 1SS133
Q117 2SC2458
R126 15K
R127 1R8K
R128 1R8K
R129 15K
R135 10K
L104
C110 470/16
C111 R1
C112 R1
R612 560 (1/2W)
RY1
R613 2R2K
R608 47K
R607 47K
RGU
Q608 2SD2037
12V
R625 330
R610 4R7
Q602 2SC5113
M601 CXM1047
D605 HZS12B2
Q603 2SC2458
C604 220/10
R609 100K
C605 100/16
D606 CXA2103
R-OUT
L-OUT
BTB 14.4V
ILLUMI 14.4V
ACC 14.3V
BTB
ILLUMI
ACC
SPIKE VOLTAGE SUPPRESSOR
POWER MOS FET
MOS FET DRIVE
+, - VOLTAGE DETECTOR
OUTPUT MUTE A
1
2
3
4
5

NOTE :

Symbol

Symbol


5
6
7
8
9
L
A
B
C
D
E
F
LIFICATION
DRIVER
(NON SWITCHING CIRCUIT)
POWER STAGE
OVER CURRENT DETECTOR
CN5
IC501 PA0016
IC502 PA0016
THERMO DETECTOR
OUTPUT IMPEDANCE COMPENSATION
IC201 NJM5532S
BUFFER
INTEGRAL
DC SERVO
OVER CURRENT DETECTOR
OUTPUT IMPEDANCE COMPENSATION
IC202 NJM5532S
AGE
OR
POWER CONTROL
MUTE CONTROL
RGULATOR
IC601
TA8194Z
B REMOTE CONTROL
ILLUMI
ACC
BATTERY POWER TERMINAL
UTPUT DC VOLTAGE DETECTOR
UTE AND RELAY DRIVE
HIGH FREQUENCY
SUPPRESSOR

NOTE:

-▭- Symbol indicates a resistor.
⊣⊢ Symbol indicates a capacitor.

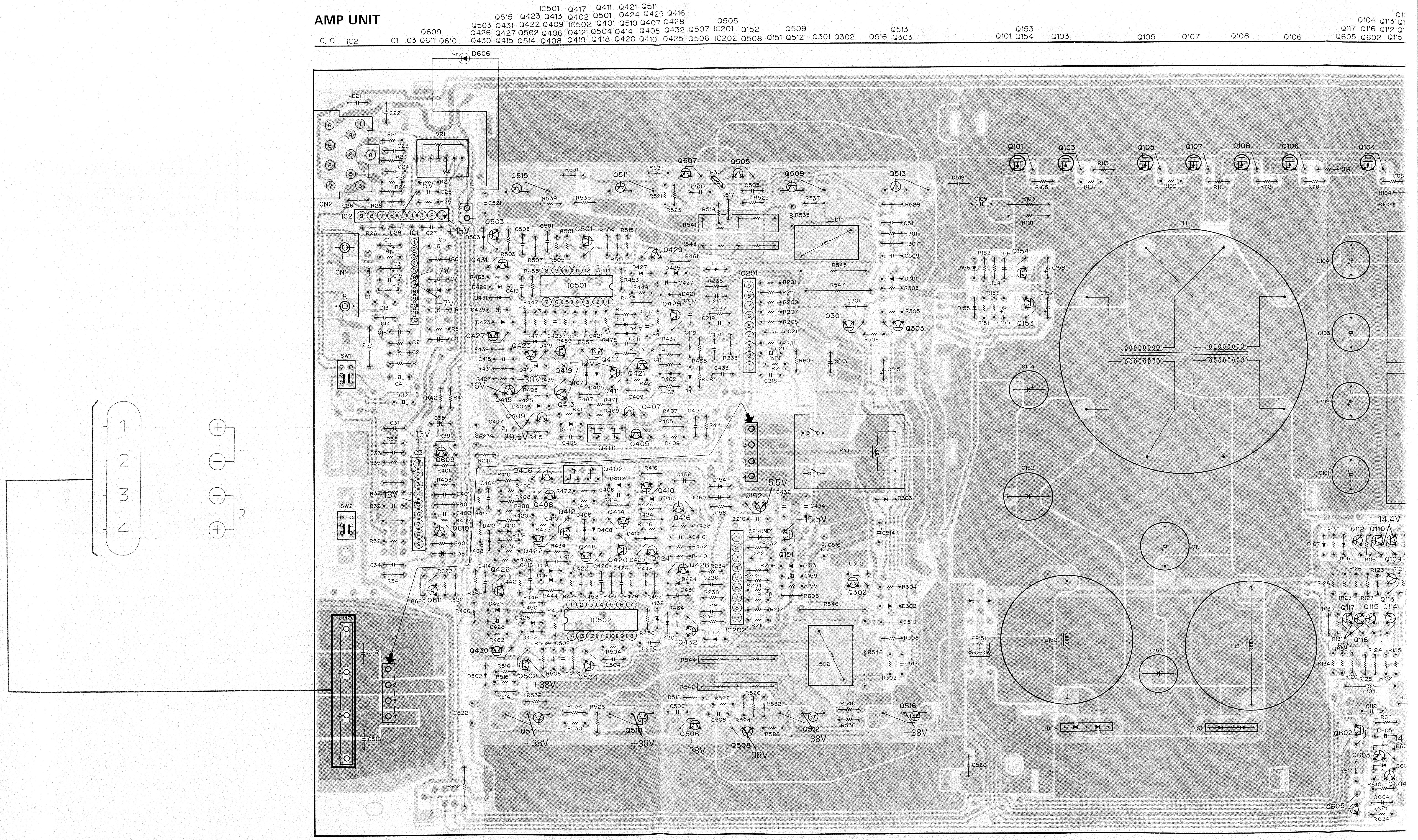
Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

SWITCHES
AMP UNIT
SW1: INPUT SELECTOR SWITCH·······RCA-DIN
SW2: DRIVE MODE SWITCH··········Dynamic/Bridge-Normal 4Ω
SW3: BFC SWITCH··················LOW-HIGH
The underlined indicates the switch position.

Fig. 7

11. CONNECTION DIAGRAM (GM-4200/EW)

AMP UNIT


IC, Q
IC2
IC1 IC3 Q611 Q610 Q609
Q503 Q426 Q430 Q515 Q431 Q427 Q415
Q423 Q422 Q502 Q514 IC501 Q413 Q409 Q406 Q408
Q417 Q402 IC502 Q412 Q419
Q411 Q501 Q401 Q504 Q418
Q421 Q424 Q510 Q414 Q420
Q511 Q429 Q407 Q405 Q410
Q416 Q428 Q432 Q425
Q505 Q507 Q506 IC201 IC202
Q152 Q508
Q151
Q509 Q512
Q301 Q302
Q513 Q516 Q303
Q153 Q101 Q154
Q103
Q105
Q107
Q108
Q106
Q104 Q117 Q605 Q113 Q116 Q602 Q112 Q115
CN1
CN2
CN5
SW1
SW2
VR1
D606
L
R
1
2
3
4
IC501
IC502
IC201
IC202
RY1
T1
L501
L502
L151
L152
EF151
D151
D152
C101
C102
C103
C104
C151
C152
C153
C154
+15V
−7V
+7V
−16V
+12V
30V
29.5V
15.5V
+15.5V
+38V
−38V
14.4V

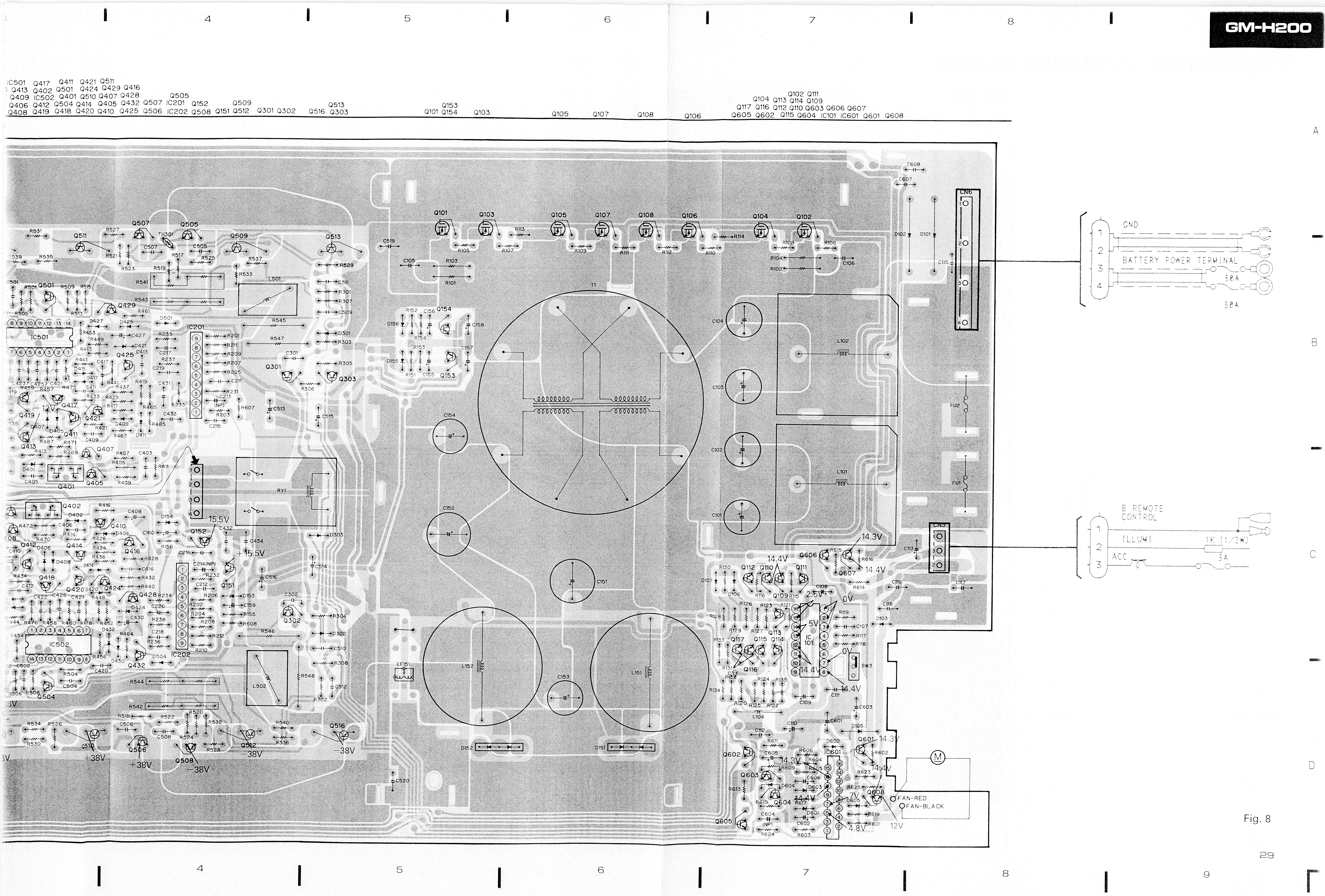

4
5
6
7
8
9
A
B
C
D
IC501 Q417 Q411 Q421 Q511
Q413 Q402 Q501 Q424 Q429 Q416
Q409 IC502 Q401 Q510 Q407 Q428
Q406 Q412 Q504 Q414 Q405 Q432 Q507 IC201 Q152 Q509 Q505
Q408 Q419 Q418 Q420 Q410 Q425 Q506 IC202 Q508 Q151 Q512 Q301 Q302 Q516 Q513 Q303
Q101 Q154 Q153 Q103 Q105 Q107 Q108 Q106
Q117 Q116 Q112 Q110 Q603 Q606 Q607 Q104 Q113 Q114 Q109 Q102 Q111
Q605 Q602 Q115 Q604 IC101 IC601 Q601 Q608
CN6
GND
BATTERY POWER TERMINAL
30A
B REMOTE CONTROL
ILLUMI
1K (1/2W)
ACC
3A
CN3
FU1
FU2
T1
L101
L102
L151
L152
RY1
EF151
SW3
M
FAN-RED
FAN-BLACK
14.3V
14.4V
2.5V
0V
5V
4.8V
7V
12V
+38V
−38V
+15.5V
15.5V
+12V

Fig. 8

12. EXPLODED VIEW

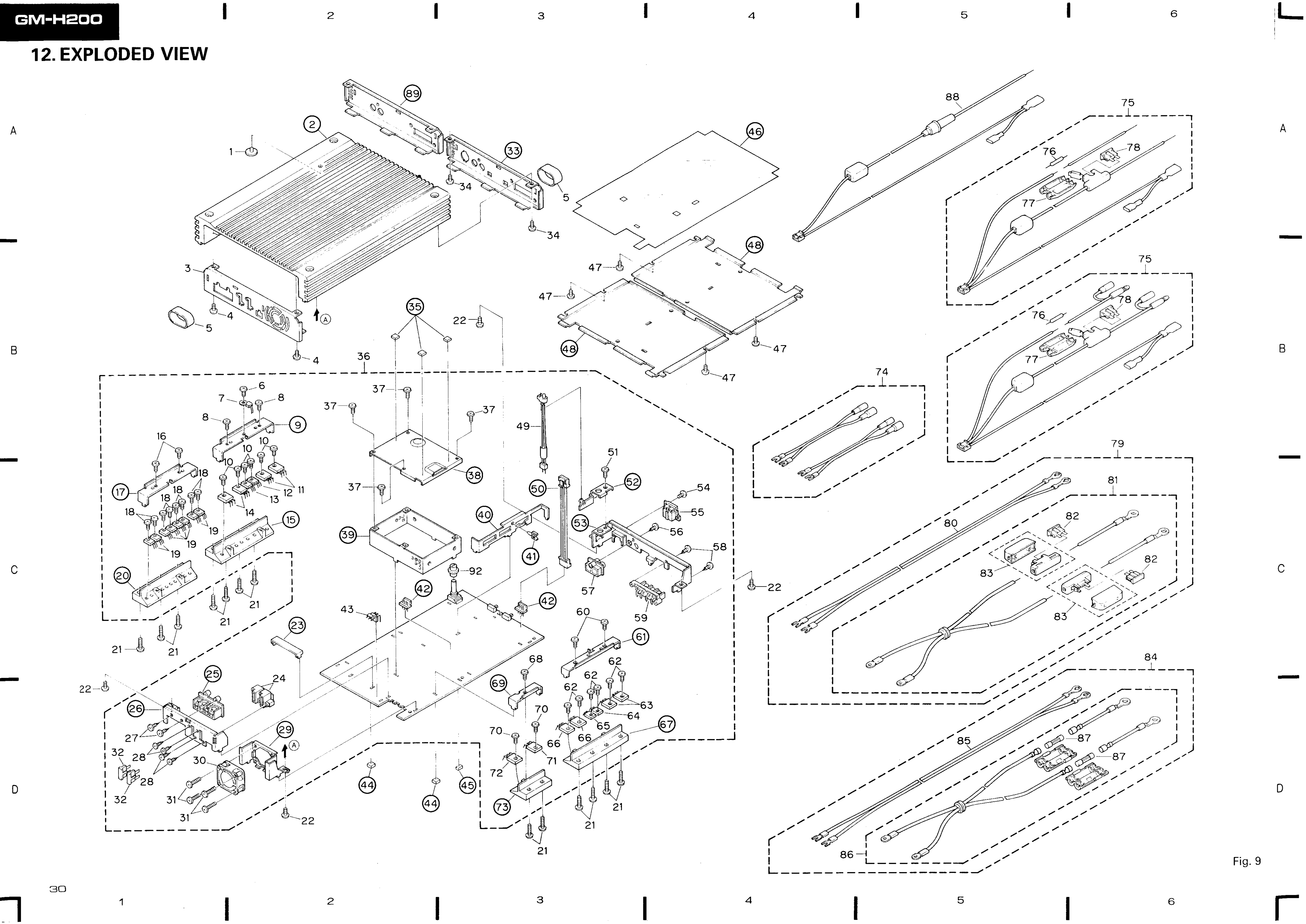

1
2
3
4
5
6
A
B
C
D
1
②
3
4
5
㉝
34
㊲
㊽
47
88
75
76
77
78
74
79
80
81
82
83
84
85
86
87
㉟
36
37
㊳
㊴
㊵
㊶
㊷
43
㊹
㊺
22
㉓
24
㉕
㉖
27
28
㉙
30
31
32
49
㊿
51
(52)
(53)
54
55
56
57
58
59
60
(61)
62
63
64
65
66
(67)
68
(69)
70
71
72
(73)
6
7
8
⑨
10
11
12
13
14
⑮
16
⑰
18
19
⑳
21
92
(89)
A

Fig. 9

• Parts l

NOTE:

- *The par*
  subject t
- *Because*
  not spar

M

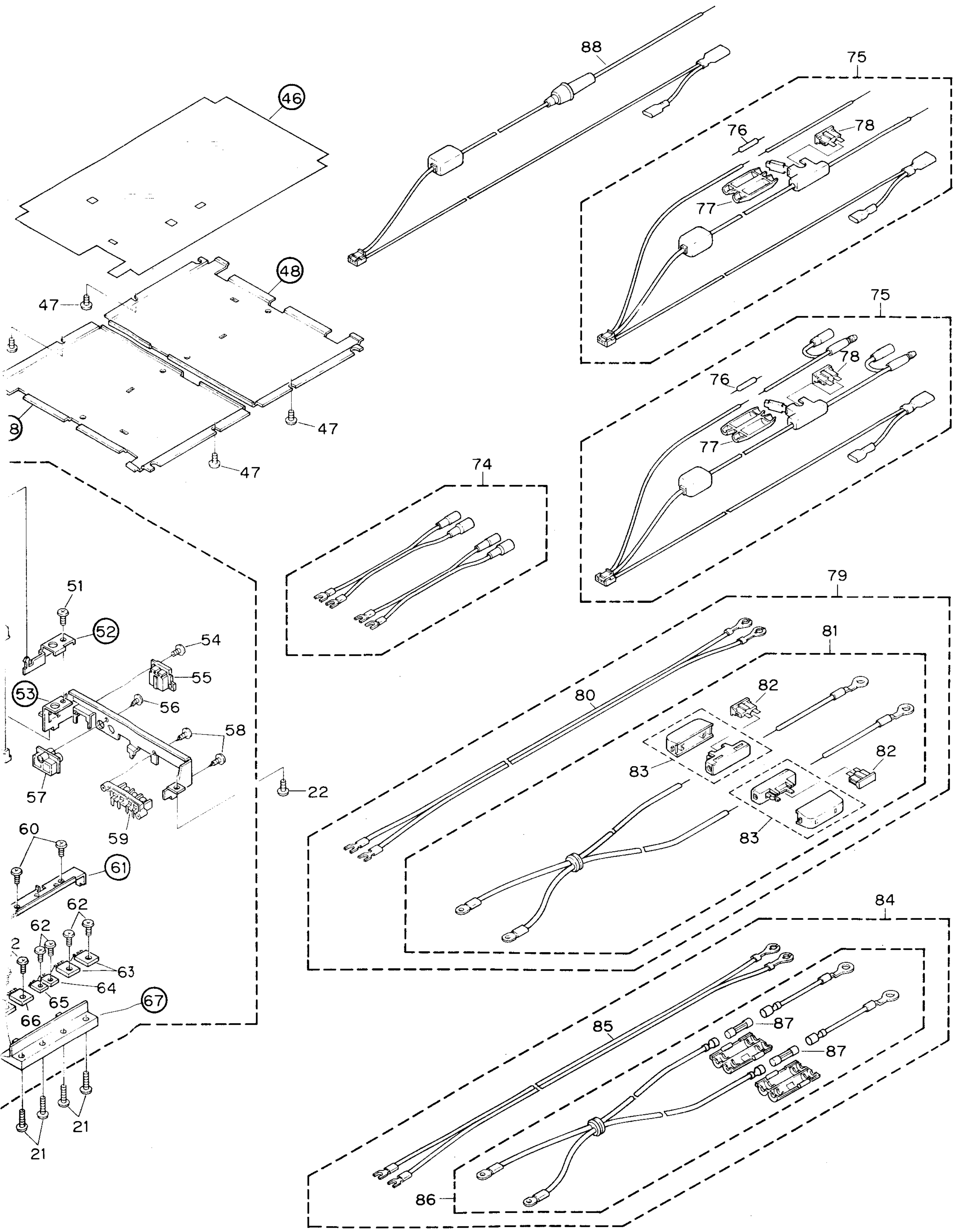


Fig. 9

• Parts List

NOTE:

- *The parts marked with "◉" may need long time to supply and their supply is subject to refuse as the case may be.*
- *Because the parts with encircled number shown on the dismantling drawing are not spare parts, we are unable to supply them in principle.*

Mark	No.	Description	Part No.
	1	Lens	CNS2050
	2	Heat Sink (UC)	CNR1186
		Heat Sink (EW)	CNR1205
	3	Panel (UC)	CNB1421
		Panel (EW)	CNB1462
	4	Screw	BBZ30P050FMC
	5	Cover	CNS2211
	6	Screw	BMZ30P050FMC
	7	Thermister	CCX1012
	8	Screw	BMZ30P050FMC
	9	Bracket	CNC3540
	10	Screw	BMZ30P080FMC
	11	Transistor	2SA1673
	12	Transistor	2SA1306
	13	Transistor	2SC3298
	14	Transistor	2SC4388
	15	Heat Sink	CNR1207
	16	Screw	BMZ30P050FMC
	17	Bracket	CNC3540
	18	Screw	BMZ30P080FMC
	19	FET	2SK1191
	20	Heat Sink	CNR1208
	21	Screw	BBZ30P180FMC
	22	Screw	BBZ30P050FMC
	23	Terminal	CNC3641
	24	Auto Fuse Holder	CKR1004
	25	Terminal	CKE1020
	26	Bracket	CNC3537
	27	Screw	PPZ30P100FZK
	28	Screw	PPZ20P080FZK
	29	Bracket	CNC3536
	30	Motor Fan	CXM1047
	31	Screw	BMZ30P250FMC
	32	Fuse	CEK1140
	33	Panel (EW)	CNB1473
	34	Screw	BBZ30P050FMC
	35	Spacer	CNM3142
◉	36	Amp Unit (UC)	CWM2782
		Amp Unit (EW)	CWM2781
	37	Screw	BMZ30P050FMC
	38	Shield Case	CNC3640
	39	Shield Case	CNC3547
	40	Holder	CNC3543
	41	Clamper	CNV1343
	42	Plug	CKS-557
	43	Plug	CKS1821
	44	Spacer	CNM3075
	45	Spacer	CNM3141
	46	Insulator	CNM3140
	47	Screw	BBT30P060FMC
	48	Case	CNB1470
	49	LED Assy	CXA2183
	50	Cord	CDE3276
	51	Screw	BMZ30P050FMC
	52	Holder	CNC3539
	53	Bracket	CNC3538
	54	Screw (EW)	BMZ20P080FMC
	55	Connector (EW)	CKS1156
	56	Screw	PPZ30P100FZK
	57	Jack	CKB1006
	58	Screw	PPZ30P100FZK
	59	Terminal	CKE1018
	60	Screw	BMZ30P050FMC
	61	Bracket	CNC3540
	62	Screw	BMZ30P080FMC
	63	Transistor	2SC4388
	64	Transistor	2SC3298
	65	Transistor	2SA1306
	66	Transistor	2SA1673
	67	Heat Sink	CNR1207
	68	Screw	BMZ30P050FMC
	69	Bracket	CNC3541
	70	Screw	BMZ30P080FMC
	71	Diode	FMG-32R
	72	Diode	FMG-32S
	73	Heat Sink	CNR1209
	74	Cord Assy	CDE3019
	75	Cord Assy (EW)	CDE3308
	76	Resistor (EW)	RS1/2P102JL
	77	Cap (EW)	CNS1472
	78	Fuse (EW)	CEK1134
	79	Cord Assy (EW)	CDE3297
	80	Cord (EW)	CDE3069
	81	Cord (EW)	CDE3299
	82	Fuse (EW)	CEK1140
	83	Auto Fuse Holder (EW)	CKR1006
	84	Cord Assy (UC)	CDE3298
	85	Cord (UC)	CDE3069
	86	Cord (UC)	CDE3068
	87	Fuse (UC)	CEK1117
	88	Cord Assy (UC)	CDE3309
	89	Panel (UC)	CNB1422
	90, 91	·····	
	92	Knob	CAA1275

13. PACKING METHOD

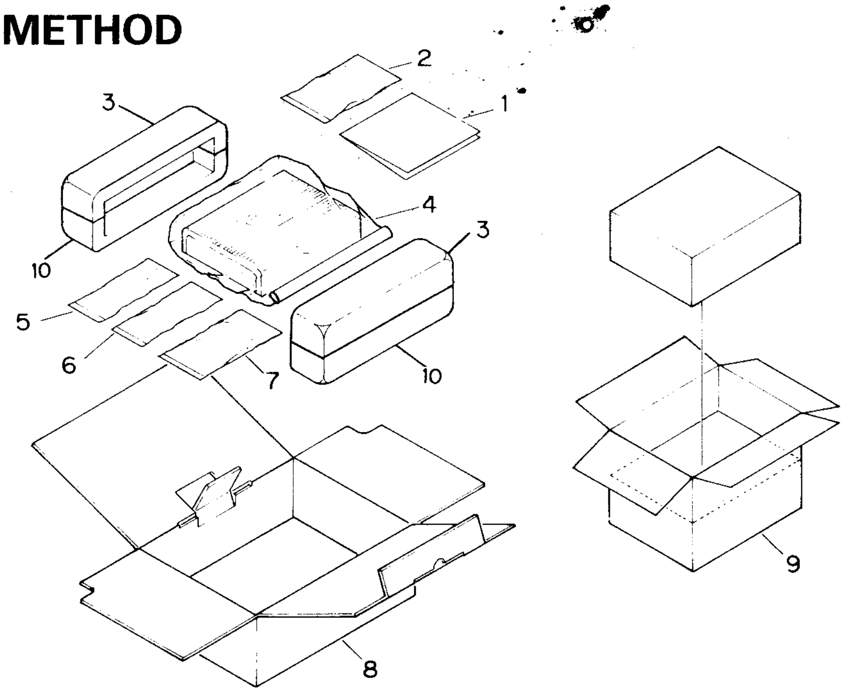


Fig. 10

● Parts List

NSP:Non Spare Part

Mark No.	Description	GM-H200/UC Part No.	GM-4200/EW Part No.
1-1	Owner's Manual	CRD1457	CRD1455
	Owner's Manual	·····	CRD1456
1-2	Card	NSP	·····
	Card	·····	NSP
2	Accessory Assy	CEA1654	CEA1654
2-1	Screw Assy	NSP	NSP
2-1-1	Screw(× 4)	HYC50P650FZK	HYC50P650FZK
2-2	Cover(× 2)	CNS2211	CNS2211
2-3	Driver	CNV2697	CNV2697
3	Styrofoam	CHP1421	CHP1421
4	Cover	CEG1100	CEG1100
5	Cord Assy	CDE3309	CDE3308
6	Cord Assy	CDE3019	CDE3019
7	Cord Assy	CDE3298	CDE3297
7-1	Cord	CDE3069	CDE3069
7-2	Cord	CDE3068	CDE3299
8	Carton	CHG2003	CHG2002
9	Contain Box	CHL2003	·····
10	Styrofoam	CHP1422	CHP1422

∗ Owner's Manual

Part No.	Model	Language
CRD1457	UC	English, French
CRD1455	EW	English, French, German, Spanish
CRD1456	EW	Swedish, Norwegian, Dutch, Italian, Finnish

14. ELECTRICAL PARTS LIST

NOTE:
- *Parts whose parts numbers are omitted are subject to being not supplied.*

• GM-H200/UC

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
	IC 1		TA8181SN
	IC 3		NJM2068S
	IC 101		UPC494C
	IC 201 202		NJM5532S
	IC 501 502		PA0016
	IC 601		TA8194Z
	Q 101 102 103 104 105 106 107 108		2SK1191
	Q 109 110		2SC3422
	Q 111 112		2SA1359
	Q 114 115 603		2SA1048
	Q 116 117 604 605		2SC2458
	Q 151 608		2SD2037
	Q 152		2SB1357
	Q 153		2SC3422
	Q 154		2SA1359
	Q 301 302		2SD1768S
	Q 303		2SB1278
	Q 401		2SK389
	Q 402		2SK389
	Q 405 406 407 408		2SC2603
	Q 409 410 411 412 413 414 415 416		2SC1845
	Q 417 418 421 422 427 428 429 430 503 504		2SA1145
	Q 419 420		2SA992
	Q 423 424 425 426 431 432 501 502		2SC2705
	Q 505 506		2SC3298
	Q 507 508		2SA1306
	Q 509 510 513 514		2SC4388
	Q 511 512 515 516		2SA1673
	Q 601		2SB1240
	Q 602		2SC3113
	Q 609 610		2SC2787
	Q 611		2SA1048
	D 1		HZS13JB3
	D 101 102		RM4Z
	D 103 303 602		ERA15-02VH
	D 105		HZ30P
	D 106 107		1SS133
	D 151		FMG-32S
	D 152		FMG-32R
	D 153 154		HZS16JB1
	D 155 156		RD3R3ESB2
	D 301 302 405 406 407 408 409 410 411 412		1SS133
	D 401 402		RD7R5JSB1
	D 403 404		HZS6B1L
	D 413 414 415 416 417 418 419 420 425 426		1SS133

Mark	Circuit Symbol & No.	Part Name	Part No.
	D 421 422 423 424		RD8R2JSB1
	D 427 428 429 430 431 432 604		1SS133
	D 501 502 503 504		1SS177
	D 601		RD6R8JSB2
	D 603		HZS9R1JB1
	D 605		HZS12JB2
	D 606	LED Assy	CXA2183
	L 1 2	Ferri-Inductor	CTF1007
	L 101 102	Coil	CTH1086
	L 104	Coil 100μH	CTF-113
	L 151 152	Choke Coil	CTH1027
	L 501 502	Coil	CTH1088
	T 1	Transformer	CTT1014
	RY 301	Relay	CSR1015
	TH 301	Thermistor	CCX1012
	M 601	Motor Fan	CXM1047
	SW 3	Switch (BFC)	HSH-156
	VR 1	Volume 5KΩ (A)	CCS1183
	FU 1 2	Fuse 30A	CEK1140
	EF 151	EMI Filter	CCG1020

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 1 2		RD1/4PS201JL
	R 3 4		RD1/4PS682JL
	R 5 6		RD1/4PS391JL
	R 31 38		RD1/4PS102JL
	R 33		RD1/4PS242JL
	R 34		RD1/4PS152JL
	R 36		RD1/4PS102JL
	R 39 40		RD1/4PS471JL
	R 41 42		RD1/4PS470JL
	R 101 102 103 104		RS1/2P330JL
	R 105 106 107 108 109 110 111 112 469 470		RD1/4PS680JL
	R 113 114 127 128		RD1/4PS182JL
	R 115 116		RD1/4PS332JL
	R 117		RN1/4PC1502D
	R 118		RD1/4PS105JL
	R 119		RD1/4PS102JL
	R 120		RD1/4PS512JL
	R 121 124 125 603 610		RD1/4PS472JL
	R 122 445 446 447 448 465 466 467 468		RD1/4PS432JL
	R 126 129		RD1/4PS153JL
	R 130		RD1/4PS223JL
	R 131		RD1/4PS184JL
	R 132 403 404		RD1/4PS224JL

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 133		RD1/4PS363JL
	R 134 231 232 409 410		RD1/4PS333JL
	R 151 152		RD1/4PS822JL
	R 153 154		RD1/4PS102JL
	R 155 156 475 476 477 478		RD1/4PS392JL
	R 201 202 203 204		RN1/4PC2202D
	R 205 206		RN1/4PC1002D
	R 207 208		RN1/4PC1002D
	R 209 210 235 236		RN1/4PC1802D
	R 211 212 237 238		RN1/4PC1803D
	R 233 234		RN1/4PC9101D
	R 239 240		RD1/4PS471JL
	R 301 302 307 308		RD1/4PS104JL
	R 303 304 433 434 435 436 607 608		RD1/4PS473JL
	R 305		RD1/4PS471JL
	R 306 613		RD1/4PS222JL
	R 401 402 602		RD1/4PS221JL
	R 405 406 407 408		RD1/4PS682JL
	R 411 412 437 438 439 440		RD1/4PS181JL
	R 413 414 423 424 425 426		RD1/4PS332JL
	R 415 416		RD1/4PS681JL
	R 417 418 419 420 429 430 431 432 605		RD1/4PS331JL
	R 421 422 521 522 533 534 535 536 537 538		RD1/4PS470JL
	R 427 428		RD1/4PS122JL
	R 441 442 443 444 501 502 503 504 513 514		RD1/4PS101JL
	R 449 450 451 452 485 486 487 488		RD1/4PS562JL
	R 453 454 455 456		RD1/4PS152JL
	R 457 458 459 460		RD1/4PS821JL
	R 461 462 463 464		RD1/4PS820JL
	R 471 472		RD1/4PS680JL
	R 505 506 507 508 517 518 519 520 604 617		RD1/4PS103JL
	R 509 510		RD1/4PS561JL
	R 515 516		RD1/4PS101JL
	R 523 524		RD1/4PS560JL
	R 525 526 527 528 529 530 531 532		RD1/4PS4R7JL
	R 539 540		RD1/4PS470JL
	R 541 542 543 544	0.33Ω × 2	CCN1041
	R 545 546		RS2P101JL
	R 547 548		RS2P100JL
	R 601 619		RD1/4PS751JL
	R 606		RD1/4PS123JL
	R 609		RD1/4PS104JL
	R 611		RD1/4PS822JL
	R 612		RS1/2P561JL
	R 620		RD1/4PS473JL
	R 621 622		RD1/4PS102JL
	R 623		RD1/4PS182JL
	R 625		RD1/4PS331JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	C 1 2		CEA3R3M50L2
	C 3 4		CEA470M16L2
	C 5 6 11 12		CEA330M16L2
	C 7		CEA470M16L2
	C 13 14		CQMA103J50
	C 15 16		CKPYB102K50L
	C 31 32		CFTNA104J50
	C 33		CKPYB391K50L
	C 34		CKPYB471K50L
	C 35 36		CEA101M10L2
	C 101 102 103 104	3900μF/16V	CCH1094
	C 105 106		CQMA153J50
	C 107		CQPA102G2A
	C 108		CEA2R2M50L2
	C 109	470μF/16V	CCH-114
	C 110	470μF/16V	CCH-114
	C 111 112		CQMA104J50
	C 113 601 603	470μF/16V	CCH-114
	C 151 152	6800μF/63V	CCH1091
	C 153 154	1000μF/63V	CCH1090
	C 155 156 157 158		CEHAQ470M50
	C 159 160		CEA101M16L2
	C 211 212 219 220		CQPAH473G2A
	C 213 214		CEA100M16NPLL
	C 215 216 405 406 411 412		CQMA103J50
	C 217 218		CCCCH390J50
	C 301 302 517 518		CQMA102J50
	C 401 402		CKPYB221K50L
	C 403 404		CQMA122J50
	C 407 408		CEA221M50L2
	C 409 410		CQMA561J50
	C 413 414 415 416		CMA121J2H
	C 417 418 419 420		CQMA102J50
	C 421 422 423 424		CCPSL680J50L
	C 425 426		CCPSL470J50L
	C 427 428 429 430		CEA101M25L2
	C 431 432 433 434 519 520 521 522		CFTNA104J50
	C 501 502 503 504		CMA470J2H
	C 505 506 507 508		CMA101J2H
	C 509 510 511 512		CQMA104J50
	C 513 514 515 516	1000μF/40V	CCH1096
	C 602		CEA220M16L2
	C 604	220μF/10V	CCH1036
	C 605		CEA101M16L2
	C 606		CEA4R7M50L2

● GM-4200/EW

Unit Number :
Unit Name : Amp Unit

MISCELLANEOUS

Mark	Circuit Symbol & No.	Part Name	Part No.
	IC 1		TA8181SN
	IC 2 3		NJM2068S
	IC 101		UPC494C
	IC 201 202		NJM5532S
	IC 501 502		PA1016
	IC 601		TA8194Z
	Q 101 102 103 104 105 106 107 108		2SK1191
	Q 109 110		2SC3422
	Q 111 112		2SA1359
	Q 113 116 117 604 605 606		2SC2458

Mark	Circuit Symbol & No.	Part Name	Part No.
	Q 114 115 603 607		2SA1048
	Q 151 608		2SD2037
	Q 152		2SB1357
	Q 153		2SC3422
	Q 154		2SA1359
	Q 301 302		2SD1768S
	Q 303		2SB1278
	Q 401		2SK389
	Q 402		2SK389
	Q 405 406 407 408		2SC2603
	Q 409 410 411 412 413 414 415 416		2SC1845
	Q 417 418 421 422 427 428 429 430 503 504		2SA1145
	Q 419 420		2SA992
	Q 423 424 425 426 431 432 501 502		2SC2705
	Q 505 506		2SC3298
	Q 507 508		2SA1306
	Q 509 510 513 514		2SC4388
	Q 511 512 515 516		2SA1673
	Q 601		2SB1240
	Q 602		2SC3113
	Q 609 610		2SC2787
	Q 611		2SA1048
	D 1		HZS13JB3
	D 101 102		RM4Z
	D 103 303 602		ERA15-02VH
	D 105		HZ30P
	D 106 107		1SS133
	D 151		FMG-32S
	D 152		FMG-32R
	D 153 154		HZS16JB1
	D 155 156		RD3R3ESB2
	D 301 302 405 406 407 408 409 410 411 412		1SS133
	D 401 402		RD7R5JSB1
	D 403 404		HZS6B1L
	D 413 414 415 416 417 418 419 420 425 426		1SS133
	D 421 422 423 424		RD8R2JSB1
	D 427 428 429 430 431 432 604		1SS133
	D 501 502 503 504		1SS177
	D 601		RD6R8JSB2
	D 603		HZS9R1JB1
	D 605		HZS12JB2
	D 606	LED Assy	CXA2183
	L 1 2	Ferri-Inductor	CTF1007
	L 101 102	Coil	CTH1086
	L 104	Coil 100μH	CTF-113
	L 151 152	Choke Coil	CTH1027
	L 501 502	Coil	CTH1088
	T 1	Transformer	CTT1014
	RY 301	Relay	CSR1015
	TH 301	Thermistor	CCX1012
	M 601	Motor Fan	CXM1047
	SW 1	Switch (INPUT SELECTOR)	CSH1021
	SW 2	Switch (DRIVE MODE SELECT)	CSH1025
	SW 3	Switch (BFC)	HSH-156
	VR 1	Volume 5KΩ (A)	CCS1183
	FU 1 2	Fuse 30A	CEK1140
	EF 151	EMI Filter	CCG1020

RESISTORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 1 2		RD1/4PS472JL
	R 3 4		RD1/4PS362JL
	R 5 6		RD1/4PS391JL
	R 21 22		RD1/4PS471JL
	R 23 24		RD1/4PS223JL
	R 25 26 27 28		RD1/4PS102JL
	R 32		RD1/4PS102JL
	R 33		RD1/4PS152JL
	R 34		RD1/4PS242JL
	R 35		RD1/4PS102JL
	R 37		RD1/4PS102JL
	R 39 40		RD1/4PS471JL
	R 41 42		RD1/4PS470JL
	R 101 102 103 104		RS1/2P330JL
	R 105 106 107 108 109 110 111 112 469 470		RD1/4PS680JL
	R 113 114 127 128		RD1/4PS182JL
	R 115 116		RD1/4PS332JL
	R 117		RN1/4PC1502D
	R 118		RD1/4PS105JL
	R 119 153 154 615		RD1/4PS102JL
	R 120		RD1/4PS512JL
	R 121 124 125 603 610		RD1/4PS472JL
	R 122 445 446 447 448 465 466 467 468		RD1/4PS432JL
	R 123		RD1/4PS102JL
	R 126 129		RD1/4PS153JL
	R 130 614		RD1/4PS223JL
	R 131		RD1/4PS184JL
	R 132 403 404		RD1/4PS224JL
	R 133		RD1/4PS363JL
	R 134 231 232 409 410		RD1/4PS333JL
	R 135 505 506 507 508 517 518 519 520 604		RD1/4PS103JL
	R 151 152 611		RD1/4PS822JL
	R 155 156 475 476 477 478		RD1/4PS392JL
	R 201 202 203 204		RN1/4PC2202D
	R 205 206 207 208		RN1/4PC1002D
	R 209 210 235 236		RN1/4PC1802D
	R 211 212 237 238		RN1/4PC1803D
	R 233 234		RN1/4PC9101D
	R 239 240		RD1/4PS471JL
	R 301 302 307 308 609		RD1/4PS104JL
	R 303 304 433 434 435 436 607 608		RD1/4PS473JL
	R 305		RD1/4PS471JL
	R 306 613		RD1/4PS222JL
	R 401 402 602		RD1/4PS221JL
	R 405 406 407 408		RD1/4PS682JL
	R 411 412 437 438 439 440		RD1/4PS181JL
	R 413 414 423 424 425 426		RD1/4PS332JL
	R 415 416		RD1/4PS681JL
	R 417 418 419 420 429 430 431 432 605		RD1/4PS331JL
	R 421 422 521 522 533 534 535 536 537 538		RD1/4PS470JL
	R 427 428		RD1/4PS122JL
	R 441 442 443 444 501 502 503 504 513 514		RD1/4PS101JL
	R 449 450 451 452 485 486 487 488		RD1/4PS562JL
	R 453 454 455 456		RD1/4PS152JL

Mark	Circuit Symbol & No.	Part Name	Part No.
	R 457 458 459 460		RD1/4PS821JL
	R 461 462 463 464		RD1/4PS820JL
	R 471 472		RD1/4PS680JL
	R 509 510		RD1/4PS561JL
	R 515 516		RD1/4PS101JL
	R 523 524		RD1/4PS560JL
	R 525 526 527 528 529 530 531 532		RD1/4PS4R7JL
	R 539 540		RD1/4PS470JL
	R 541 542 543 544	0.33Ω×2	CCN1041
	R 545 546		RS2P101JL
	R 547 548		RS2P100JL
	R 601 619		RD1/4PS751JL
	R 606		RD1/4PS123JL
	R 612		RS1/2P561JL
	R 616 617		RD1/4PS103JL
	R 620		RD1/4PS473JL
	R 621 622		RD1/4PS102JL
	R 623 624		RD1/4PS182JL
	R 625		RD1/4PS331JL

CAPACITORS

Mark	Circuit Symbol & No.	Part Name	Part No.
	C 1 2		CEA3R3M50L2
	C 3 4		CEA470M16L2
	C 5 6 11 12		CEA330M16L2
	C 7		CEA470M16L2
	C 13 14		CQMA103J50
	C 15 16 401 402		CKPYB221K50L
	C 21 22		CQMA104J50
	C 23 24 34		CKPYB391K50L
	C 25 26		CKPYB101K50L
	C 27 28		CKPYY103M16L
	C 31 32		CFTNA104J50
	C 33		CKPYB471K50L
	C 35 36		CEA101M10L2
	C 101 102 103 104	3900µF/16V	CCH1094
	C 105 106		CQMA153J50
	C 107		CQPA102G2A
	C 108		CEA2R2M50L2
	C 109	470µF/16V	CCH-114
	C 110	470µF/16V	CCH-114
	C 111 112		CQMA104J50
	C 113 601 603	470µF/16V	CCH-114
	C 115 116 117 118 607 608		CKCYF473Z50
	C 151 152	6800µF/63V	CCH1091
	C 153 154	1000µF/63V	CCH1090
	C 155 156 157 158		CEHAQ470M50
	C 159 160		CEA101M16L2
	C 211 212 219 220		CQPAH473G2A
	C 213 214		CEA100M16NPLL
	C 215 216 405 406 411 412		CQMA103J50
	C 217 218		CCCCH390J50
	C 301 302 517 518		CQMA102J50
	C 403 404		CQMA122J50
	C 407 408		CEA221M50L2
	C 409 410		CQMA561J50

Mark	Circuit Symbol & No.	Part Name	Part No.
	C 413 414 415 416		CMA121J2H
	C 417 418 419 420		CQMA102J50
	C 421 422 423 424		CCPSL680J50L
	C 425 426		CCPSL470J50L
	C 427 428 429 430		CEA101M25L2
	C 431 432 433 434 519 520 521 522		CFTNA104J50
	C 501 502 503 504		CMA470J2H
	C 505 506 507 508		CMA101J2H
	C 509 510 511 512		CQMA104J50
	C 513 514 515 516	1000µF/40V	CCH1096
	C 602		CEA220M16L2
	C 604	220µF/10V	CCH1036
	C 605		CEA101M16L2
	C 606		CEA4R7M50L2